REMARKS
ON
HYDROPHOBIA;
OR THE
DISEASE
PRODUCED BY THE
BITE of a MAD DOG,
OR OTHER
RABID ANIMAL.

By ROBERT HAMILTON, M. D. K

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OF THE ROYAL MEDICAL AND PHYSICAL SOCIETIES, EDINBURGH;
OF THE MEDICAL SOCIETY, LONDON;
AND LATE PHYSICIAN TO THE ARMY.

IN TWO VOLUMES.
THE SECOND EDITION, WITH ADDITIONS AND CORRECTIONS.

Morsu virus habent, et fatum dente minantur. Lucan. Pharsal.
Aliorum factis, nobis quod ex usu sit admonemur. Crato.

Vol. I.

SOLD BY LONGMAN, PATERNOSTER ROW, LONDON,
1798.

BRITISH MUSEUM

TO THE

Rev. JAMES CALDWELL,

In the County of Down, Ireland.

Dear Sir,

I Know not to whom we are more obliged, than to thoſe who have had the care of our earlier inſtruction. To conſcientious and diligent preceptors mankind are more indebted for future happineſs, and often for future fame, than to ſplendid titles, or to great wealth; yet the rank or the emoluments far from compenſate the toil and utility of the teacher.

Under your tuition I ſpent ſome happy years, looking forward with youthful hope and ſanguine expectation to pupil emancipation, and to manhood, when the ſmiles of fortune, as warm imagina-

imagination had figured, ſhould ſucceed ſchool-boy cares; and eaſy competency, if not wealth, follow a life of active and uſeful induſtry. Gaudy illuſion! puerile anticipation!

When this period arrived the title of friend ſucceeded to that of preceptor. In the former capacity you were no leſs inſtructive to your younger aſſociate than in the latter. The familiarity of the friend ſerved to heighten the moral precept, and the ſocial hour of rational gaity ſweetened inſtruction. Diſtance of time has only mellowed, not obliterated the picture from my mind. Your pupil, therefore, grateful for inſtruction, grateful for friendſhip, offers you this humble tribute, and as a ſmall return thus publicly makes his acknowledgements.

The obſervations which follow in theſe pages can afford you but little entertainment; the ſacred duties of religion lead you from ſuch ſtudies. In dedicating them to you however, I diſcharge a taſk, a willing obligation, for which I have long made myſelf debtor. May you be *happy, and may eternal felicity crown your virtuous miniſtry and Chriſtian hopes!*

I remain,

Dear Sir,

With great friendſhip, reſpect, and eſteem,

Your moſt obedient,

And very humble ſervant,

R. HAMILTON.

IPSWICH, *March*, 1798.

TO THE READER.

THE ſhort time which I enjoyed the rank of Phyſician to the Army ſcarcely warrants me to notice it in my title page, two months being its limits. A calamity into which I fell about the time of my appointment,* was the means of depriving me of this rank. After a ſevere and tedious fever I totally loſt my ſight, and was on that account ſuperceded. It has not hitherto been thought expedient to compenſate me for this misfortune, by any other appointment either civil or military.

A few years of my life were formerly ſpent in the army, in a medical capacity, where the duties of my humbler ſtation were *ſcrupulouſly* and conſcientiouſly diſcharged;* but the ſituation did not, on leaving the army, entitle me to half pay, and cuſtom, it ſeems, does not ſanction ſuch a recompence for that of phyſician, where the ſervices have been ſo limited, whatever the circumſtances of the caſe may be. In the retirement therefore from buſineſs which followed, I turned my attention to the reviſal of a treatiſe formerly compoſed on Hydrophobia.† The reaſons firſt leading to that treatiſe may be ſeen in the Preface. This reviſal indeed has been followed by ſo conſiderable a number of additions and corrections, that it deſerves more the title of a new treatiſe, than a ſecond edition of the old; but whether a better elucidation of this abſtruſe diſeaſe (the point in view) be attained, the reader muſt determine.

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* In the ſummer of 1795.

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* The reſult of my obſervations during this period are already before the public. Vide Duties of a Regimental Surgeon, &c.

† A tranſlation of the firſt edition into German, with notes, was publiſhed at Leipſic, by Dr. Michaelis, 1787.

Errors from the nature of the ſubject are unavoidable; and for errors, which cannot be few, ariſing from the want of that ſtricter examination which ſight would afford, I muſt entreat the benevolent indulgence of the ſympathiſing reader.

PREFACE

TO THE FIRST EDITION.

IN conſequence of an accident from the bite of a mad dog having lately happened, whereby a young gentleman of a reſpectable family in the county of Suffolk loſt his life,* a few obſervations on the means of preventing Hydrophobia were then inſerted in the Ipſwich Journal, for the peruſal of the neighbourhood, to enable them, in ſome meaſure, to oppoſe the fatal effects of the bite of a rabid animal, ſhould the like happen among them in future.

---

* Son of Admiral Sir Joſhua Rowley.

Though drawn up in haſte, and publiſhed incorrectly, yet they were read, and, in general, met with approbation; but as the limits of a newſpaper confined them to a very narrow compaſs, and forbade a more minute diſcuſſion, the author, who was ſoon diſcovered, was ſolicited to enter more fully into the ſubject, and lay them before the public in form of a pamphlet.

With this he complied, yet not without heſitation, when he conſidered how many eminent men had trod the ſame path before him, whom, inſtead of expecting to ſurpaſs, he knew he muſt be contented to follow at an humble diſtance.

Though the partiality of friends flattered him that his remarks would be acceptable, yet the taſk was not undertaken from a preſumption of being able to convey more information to medical men than what authors had already done, but ſolely with a deſire to be uſeful, as far as he was able, to that part of the community with which he was now more immediately connected;

and among whom the recent misfortune had ſpread conſiderable alarm.

Beyond the limits of a pamphlet at firſt, and a ſhort one, it was not his intention to lengthen theſe pages; but in purſuing his plan it was found impoſſible to furniſh even a well-digeſted outline, much leſs diſcuſs the ſubject with any degree of perſpicuity within ſo narrow a compaſs; hence they were extended.

He has ventured throughout to deliver his ſentiments freely, though with deference, and as freely canvaſſed thoſe of men greatly his ſuperiors in abilities and conſequence, in the ſcale of ſcience. For this he hopes, however, the public will acquit him, by allowing a right to offer his opinion, provided it be done with becoming modeſty. Here indeed *they* muſt be the judges; and he truſts that he ſhall not be found, in the following pages, to have transgreſſed in this reſpect.

He has collected obſervations from the works of authors both ancient and modern, and endeavoured,

deavoured, as far as he was able, to diſtinguiſh between what could be ſupported on the grounds of rational induction, and what had only (as appeared to him) ſuperſtition and credulity to lean on.

This eſſay* is not offered to the public as perfect; far from it. The author is too conſcious of its imperfections. Yet he hopes it will be found to contain at leaſt an outline of what is known on the ſubject. Hints, perhaps, may be gathered from it, as materials for others to work with, who may hereafter turn their attention to its farther inveſtigation. With this view he ſubmits himſelf to the public tribunal, not doubting but he ſhall meet with clemency; and that it will at leaſt correct with lenity, where the candour of criticiſm cannot beſtow approbation.

He would here alſo beg leave to offer his thanks to thoſe gentlemen who favoured him with communications, and for the public uſe ſeveral of them ſo readily allowed him to make of their remarks. Among others, he holds himſelf particularly obliged to the ingenious and indefatigable Mr. John Hunter,* who not only honoured the author with frequent correſpondence, but with a liberality of mind, allowed a public uſe of the information conveyed, with the ſanction of his name to corroborate it; a name which every cultivator of medical ſcience muſt long hold in eſteem. To Sir Thomas Gooch, Bart. he likewiſe returns thanks for the honour he conferred by his letters, and the ſatisfaction his anſwers afforded to ſome enquiries made on the ſubject.

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* The ſame may be ſaid of the preſent edition.

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* Since this was written the public has to lament the death of this great phyſiologiſt.

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ERRATA.

ERRATA.

Page.
3 line 13, for 10*th* read 14th.
5 — 12, for *melancholy* read a melancholy.
6 — note, for *ſhew* read ſhow.
17 — 5, for *æſophagus* read œſophagus, *paſſim.*
——— 2 from bottom, for 80 read 80°
18 — 6, for *was* read were.
19 — 13, for *which* read who.
20 — 1, after houſe read (,)
——— 3, for *laid* read lay.
——— 18, for *they obſerved* read obſerved by the family.
——— 21, for *its* read her.
21 — 1, for *it* read the bitch.
——— 19, dele *however.*
——— 23, for *its* read her.
22 — 7, for *was* read were.
24 — 2, for *or* read nor.
33 — 3, for *in* read into.
——— 4, for *carried* read carry it.
40 — 16, for *has* read have.
43 — 17, for (.) read (,) and add, abſorb lymph from cavities, and matter applied to the external ſurface.
47 — 1, for *ſubſtraction* read ſubtraction.
48 — 11, for *in* read on a.
53 — note, laſt line, after and read hence.
60 — 5, for *faſter than* read as ſoon as.
62 — 4, for *laureo-ceraſus* read lauro-ceraſus, *paſſim.*
64 — 10, for *innoculation* read inoculation, *paſſim.*
——— 3 from bottom, for *exilla* read axilla.
89 — 1, after almoſt add the.
91 — 1, after and add the.
100 — 11, for *its* read their.
102 — 9, for *fell* read fallen.
104 — 3, for *occular* read ocular.
——— for *negroe* read negro, *paſſim.*
07 — 4, for *conſiſtent* read conſiſtently.
——— 6 from bottom, after have read had.
29 — 11, for *have* read has.
132 — 7, for *where* read were.
133 — 4, note, for *poſitiveneſs* read confidence.
314 — 8 from bottom, dele be.

Page.
136 — 5 from bottom, for *which* read whom.
142 — 2, note, after country read (;) after time dele (;)
145 — 6, for *where* read were.
154 — 5 and 6 from bottom, for *tore* read torn.
160 — 12, for *ſpeecial* read ſpecial.
167 — 7 from bottom, after grant read that.
175 — for *preventative* read preventive, *paſſim*.
177 — 5, for *nor* read or.
178 — 11, after find dele that.
179 — 11, for *prevented* read preſerved.
185 — for *Haulſton* read Houlſton.
189 — 2, for *phyſiologiſts* read pathologiſts.
195 — 3, after ſuppoſed add to be.
199 — 4, for *principle* read principal.
202 — 12, for *Illiad* read Iliad.
204 — 11, for *with ſometimes* read ſometimes with.
212 — 4 from bottom, after from add producing.
215 — 13, for *vomitted* read vomited.
217 — 9, for *reaching* read retching.
218 — 9, for *it* read the vomiting.
223 — 6, for *which* read whom.
——— 12, for *which* read who.
——— 16, for *which* read whom.
224 — 8, for *which* read who.
——— 14, for *which* read who.
227 — 2, for *periſhing* read who periſhed.
237 — 12, after this add to be.
——— 5 from bottom, for *of diſtinction of* read of a diſtinction between.
245 — 4, dele *however*.
——— 8, dele *however*.
250 — 13, for *which* read whom.
254 — 4 from bottom, for *commencement* read commencing.
258 — 13, for *leiſon* read leſion.
——— 17, for *leiſons* read leſions.
259 — 5, for *leiſons* read leſions.
269 — 6, dele *however*.
——— 15, for *geral* read general.
278 — 7, dele *however*.
——— 4 from bottom, dele *however*.

☞ The reader is requeſted to correct miſplaced commas when they occur.

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MUSEUM

REMARKS
ON
HYDROPHOBIA,
&c.

MANY authors of reſpectable abilities have attempted to inveſtigate the nature of the diſeaſe occaſioned by the poiſon from the bite of a rabid animal. Much has been written, many theories hazarded, and as many remedies propoſed to combat it for upwards of two thouſand years[a], ſince the malady was firſt deſcribed. Yet it ſtill remains in a great meaſure the reproach of the medical profeſſion.

Of late it ſeems to be more prevalent than heretofore. This is a lamentable reflection when

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[a] Since the days of Ariſtotle, for not long before his time the diſeaſe according to ſome had its origin. This opinion admits of much doubt, but of this afterwards.

we conſider that the diſeaſe has in no inſtance, after Hydrophobia is fully eſtabliſhed, admitted of a cure. Its frequency may be attributed to two cauſes; the one, indeed, is the conſequence of the other: firſt, the fondneſs we expreſs for the dog, which brings him ſo often into our company; and ſecondly, the great multiplication of the animal. His utility in ſocial life, and the gratitude we bear him, for his attachment, in forſaking his own tribe to follow our deſtiny, will in ſome meaſure explain this.

Thouſands, as is too well known, are bred more for amuſement than for advantage to their owners. A good houſe-dog in former days was the only ſpecies to be found in a farmer's yard; or a common cur at a cottage door. Theſe were kept for the protection of the family: nor does it appear that the breed was either greatly multiplied or fed, in this country at leaſt, for mere paſtime. It is different at preſent; every labourer and mechanic has not only his dog, but perhaps two or three. The opulent farmer and the man of landed property, ſeveral brace. It is not uncommon to ſee even a dozen or more of ſporting dogs in a farm houſe.

Were I to offer a conjecture on the cauſes of this, I ſhould attribute it in part, to our game laws. The game abounds from the conſtant care taken for its preſervation. Every inhabitant is a *ſportſman* in ſome meaſure, where it is thus in plenty, and he who cannot lawfully kill it, never fails to ſteal; or in other words is a poacher. Although there be a law to reſtrain unqualified perſons from carrying guns, yet there is none I believe againſt keeping a dog[b]. With this and his net the poacher's purpoſe is anſwered.

From the 10th of September during the enſuing ſix months annually, the ſports of the field, i. e. purſuing game with packs of dogs, or with pointers, greyhounds, or other ſpecies of this animal, occupy the greater number of the male part of the community, high and low, in this country.

Againſt the amuſement in general, however, I make no other reflection than as far as it concerns my ſubject; the legiſlature, not an individual, is the proper power, if it be found a nuiſance, to interfere. Let the multiplication of this animal proceed from what ſource it

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[b] Since writing the above, I find this alſo is unlawful.

it may, one thing appears evident, that the diſeaſe I am about to conſider has been more frequent than common for the laſt fifteen years, and the ſubject on that account the more intereſting.

Though the cat equally communicates this malady with the dog, our attachment to this creature is by no means equal. We multiply it therefore no farther than its domeſtic utility requires, and in proportion we find fewer of this ſpecies under this diſeaſe. This is one reaſon; but whatever other reaſons we may adduce to explain the infrequency of feline madneſs ſhall be reſerved for a future part of theſe pages[c].

Our lives and property, from the propagation of this diſeaſe, are both at iſſue; the malady is not more fatal to ourſelves, than it is to our domeſtic animals, in which lie ſo much of the comforts and conveniencies of life; horſes, cows, hogs, and other live ſtock, forming a great proportion of the wealth of this nation, often ſuffer thereby.

An infected dog may wound many hundreds of theſe animals before he can be killed, or before the diſeaſe of itſelf terminates his life. He may traverſe counties, leaving diſmal marks of his deſtruction in every pariſh, not only among flocks and herds of cattle, but among his own ſpecies, multiplying the malady in proportion to the numbers he bites; from whence again the infection is propagated to a dreadful length, like the ravages of a peſtilential fever, before its progreſs can be checked and all that had been bitten deſtroyed. It is but a few years ſince this obſervation received in this neighbourhood melancholy confirmation. Several of the human ſpecies (nine it is affirmed) and much property in live ſtock were deſtroyed by one dog alone, committing devaſtation for three days together before he could be killed in the adjoining county[d].

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[c] Vide Remote Cauſe.

The greater frequency of the diſeaſe has of late been obſerved in America[e], as well as in Great Britain. If it is not to be attributed to the multiplication of the dog in both countries more than formerly, it may be difficult to explain to what it ſhould be placed; for climate I think is by no means the chief, though a conſiderable agent in its excitement. Though it is an infectious diſeaſe, and appears to me therefore

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[d] Eſſex in 1792.

[e] Vide American Tranſactions, Vol. 3.

therefore ſeldom induced but by infection from a rabid animal[f], yet, perhaps, it is not impoſſible, that it may ariſe from internal cauſes and without communication.

It is affirmed, that in Jamaica the diſeaſe has not appeared among dogs for near fifty years paſt; and that in the Iſland of Antigua it is altogether unknown. If it was induced by a warm climate alone, in what part of the world are we to look for greater heat? We are likewiſe aſſured that the animal abounds in Jamaica, even more than in Great Britain. The Negro prides himſelf as much in his dog as any ſportſman does in England; and is allowed to indulge himſelf in this reſpect[g]. It may be aſked, where have we a ſtronger proof of its not ariſing ſpontaneouſly in the animal, than from this circumſtance? Yet ſuch a concluſion muſt not be haſtily drawn. In what manner its firſt appearance took place, ſeems equally as obſcure as the firſt origin of other infectious ſpecific diſeaſes. How did the ſmall-pox firſt ariſe? The anſwer is difficult.—Thus far we know, it was brought from Eaſtern countries—Climates warmer than where it now rages. But do we ever obſerve it ariſe without infection? Although it may be difficult to prove this, yet I would not poſitively deny it.

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[f] Both climate and diet greatly influence animal life and health, as we ſhall ſhew hereafter.

[g] Vide Tranſactions of a Society for the improvement of medical and chirurgical knowledge.

The derived ſmall-pox, indeed, is moſt frequent, but from this merely I ſhould deem it raſh to deny, that there may not be ſituations in which the animal fluids can breed the complaint; or a combination of particles from internal cauſes be united, forming the infection, giving birth to the diſeaſe, without any communication with perſons under it, and without the leaſt contact with variolous matter proceeding from another ſubject. We may transfer the ſame reaſoning to the diſeaſe under conſideration, and challenge the validity of thoſe arguments which would exclude ſpontaneous Hydrophobia, and confine it ſolely to inoculation from a rabid animal.

As the cat is uſeful to domeſtic œconomy, and as in every houſe one or more are kept, danger ariſes from them, ſince this creature is ſubject to the diſeaſe. Finding ourſelves, therefore, daily expoſed to miſchief, from theſe ſecond, and equally conſtant inmates, and being apprized of the loſs ſociety may ſuſtain from their madneſs, thoſe, whoſe province it is, it is hoped, will be rouzed to more attention, whether they be legiſlators or phyſicians, and endeavour both ſeparately and conjointly to arreſt its progreſs, the one by judicious reſtraints on the multiplication of both dog and cat, the other by endeavours to inveſtigate the nature of this abſtruſe malady, and bring the cure to greater certainty.

Some have contended that the virus chiefly belongs to the dog kind, viz. the dog ſo diſtinguiſhed, the wolf, the fox, and the jackall. I am ignorant whether there be any inſtance of its propagation aſcertained in this laſt, but ſince naturaliſts have diſcovered it to be of the dog claſs, I mention it. I add the cat, the domeſtic animal of this name, becauſe we have proofs too numerous of its capability of communicating the diſeaſe. It is doubtful, perhaps, whether it ſhould be extended to all the claſs of the feline tribe, but we have little to do with the lion, the tyger, and other wild animals of this genus. The illuſtrious Boerhave, indeed, extended it much farther; and was of opinion it might be received not from theſe only, but from " Equi, aſini, muli, "boves, ſues, ſimii, galli, gallinacei, et "homines,"—to uſe his own words; and he adds, "Id vitium prius rabioſi in alios pro-"pagaverunt;" but to this I cannot give my aſſent. Some proofs to the contrary ſhall be adduced hereafter.

A ſtory has been propagated, but on what foundation is not diſcovered, that, in the county of Suſſex, a few years ago, a cow under the influence of Hydrophobia, in attempting to bite, dropt her ſaliva on a man, who was ſaid to have contracted the diſeaſe in conſequence, and died of it in the uſual way: but ſuſpecting this to be an idle tale, ſome pains have been taken to diſcover the truth of the rumour. The reſult was, that nothing of the kind had ever been heard of in the neighbourhood where it was ſaid to have happened[h].

Since the firſt edition of theſe obſervations, though only about ten years, ſeveral perſons in this county[i] have ſuffered from the malady;

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[h] Dr. White of Bury St. Edmund's, who communicated this report to me, and who alſo doubted its authenticity, wrote to the Dean of Chicheſter on the ſubject, whoſe anſwer was ſatisfactorily negative.

[i] Suffolk.

yet I am inclined to think ſeveral others eſcaped by attending to the directions inculcated in thoſe pages. It is true, we have no abſolute proof whether the poiſon would have taken effect, but by acting as if we were certain of the fact we inſure ſafety; while we have the double advantage of removing both apprehenſion and danger.

The cows, oxen, &c. that were bitten in this neighbourhood became affected and died. Several perſons ſuffered in their fortunes, and an alarm for their own ſafety excited much uneaſineſs throughout the country. This produced at that time public meetings among the people, to deliberate on the beſt meaſures to be purſued to prevent future miſchief; the reſult of which was a petition to parliament. It was reſolved to ſolicit the interference of government, in order to impoſe a tax on all who kept theſe animals. The propoſal, however, at that time met with no encouragement from the legiſlature[k]. The principle on which the diſcuſſion turned, was to leſſen the number of theſe animals, and doubtleſs this was the grand hinge.

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[k] A tax has ſince been laid on dogs; but it appears to be more a tax of revenue than of policy, or a preventative of the frequency of hydrophobia. It ſeems too ſmall to anſwer this end; few will deſtroy their dogs, or keep a leſs number on that account.

Every man conſiders that he has a right to keep his dog, if he poſſeſſes the means of giving him food. The poor man would think himſelf greatly oppreſſed ſhould he be deprived of the pleaſure of his faithful companion by a compulſive law; and this right we acknowledge: but each party ought to relinquiſh ſomething, as in other caſes of ſocial compact, for the ſecurity of the whole. This will be conſonant to ſound policy.

When the malady termed Hydrophobia has once appeared, a death attended with dreadful circumſtances beyond other diſeaſes awaits the ſufferer, and *inevitably* awaits him. Prophylactick means, indeed, are in our power, even when a perſon has received a wound; and theſe it is undoubtedly our duty to proſecute. For though we have hitherto failed in curing, yet by timely care and perſeverance, we may, I am perſuaded, with tolerable certainty, obviate the malady.

The firſt queſtion that naturally occurs here, is, what are the ſigns by which we can diſcover the firſt ſtage of madneſs in the canine tribe? This ſeems a neceſſary enquiry, ſince moſt perſons are ſo ignorant of it as to ruſh precipitately on their ruin, by attempting to fondle, or ſhew marks of raſh and miſplaced kindneſs to dogs not only in this, but almoſt in the laſt ſtage of their illneſs.

The dog forſakes his own tribe, and adheres with ſtrict fidelity to his maſter. This gives us an opportunity for obſervation. Thoſe who are accuſtomed to this animal can pronounce when he is diſordered, from his manner, comparing it with his healthy condition, with as much certainty as when any of their family are indiſpoſed.

In the early ſtage, however, the difference between this and other diſeaſes is not ſo obvious, for it has ſeveral ſymptoms in common with them. We find the ſame, indeed, in many of thoſe affections incident to the human body. In the firſt day, the fever that precedes the eruption of ſmall-pox or meaſles is difficult to be aſcertained, and diſtinguiſhed from others, except from the preſumption of one or other of theſe diſorders being prevalent in the place. A little time longer, however, removes doubt; we then obſerve ſome ſymptoms peculiar to the reſpective diſeaſe with which the individual is affected. The ſame may be applied to madneſs in dogs.

SYMPTOMS IN THE DOG.

NOTWITHSTANDING this uncertainty ſome ſymptoms ſhall be mentioned peculiar to and forming this malady.

I. A diſinclination for his food. He does not, it is true, refuſe it; but he takes it with an evident indifference and liſtleſſneſs; this indeed is not peculiar.

II. He is melancholy. It is as eaſy to mark this ſymptom in the dog as in the human ſpecies. In health he is frolickſome and playful; but now he hangs his tail, and at the approach of his maſter or any other of the family, ſhews leſs of that joy with which he was wont to welcome them on their return home.

III. His eyes appear mixed and dull. This may be called the firſt ſtage; yet there is ſcarcely any thing pathognomonic here. It ſhould be obſerved, that in this ſtage he will ſtill obey the call of his maſter, and follow him, nay, he will even fawn on him when he approaches; but his memory is leſs accurate and he occaſionally forgets him. His irregular peeviſhneſs at this time points out he is greatly indiſpoſed. It becomes now highly proper to regard our ſafety, and not to truſt him if he ſnarls; nor ought we to attempt to careſs him.

As the firſt ſtage of the diſeaſe is indiſtinct and marks nothing peculiar, we may be in danger from want of ſuſpicion of the nature of the malady; but let the indiſpoſition of a dog be ever ſo ſlight, prudence ought to direct us to treat it as of importance.

The ſecond is more diſtinctly marked; for in a day or two he feeds with leſs avidity, though he does not refuſe, as has been ſaid, his victuals; authors have affirmed, but erroneouſly, that at this time he refuſes drink. He now ſhuns other dogs, and is equally ſhunned by them[1]. Obſervation, I think, does not confirm that the healthy ſhun the infected in other diſeaſes, to which in common with other animals they are liable.

Now comes the laſt ſtage; he loſes altogether his recollection, quits his maſter's houſe, runs forwards he knows not where, and without any particular deſign, ruſhes in his fury, and without barking, at every animal that comes in his way, but turns not aſide to bite any, and in the ſpace of two days after, or leſs, dies convulſed. If he is tied up he bites at his chain in this ſtage of the malady, and is furious when approached.

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[1] The obſervation of this ſymptom is attributed to a lady who reſided at the village of Medoc near Bourdeaux.

M. Roux confirms the obſervation, that mad dogs are ſhunned by other dogs.—Vide hiſtoire et memoires de la Soc. Roy. de Medecine. année, 1783.

The ſymptom of a drooping tail is more remarkable in this than in the former ſtage; another is likewiſe evident, viz. a convexity of the back, formed by drawing his hinder towards his fore legs, an indication of great uneaſineſs in the bowels. This is likewiſe accompanied by an extreme dryneſs of the noſe.

In all the different animals under Hydrophobia (the dog included) the diſeaſe attacks by exacerbation and interval.—I can inſtance this from good authority and ocular inſpection[m].

One thing is remarkable; and in which among others he materially differs from man under the ſame diſeaſe; he never avoids water, having no fear of it; and as it would ſeem, feeling no inconvenience either from drinking or touching it. I know from experience, he laps whatever liquid food is ſet before him, long after the poiſon can be communicated by his bite. Previous to his death ſome ſwellings about his throat *are ſaid* to have been obſerved, and even the tongue has been affected in the ſame manner, and dripping with ſlaver: ſometimes it has been ſeen to loll out of his mouth. Such is the common progreſs of the ſufferings of a rabid dog, and ſuch are the chief ſymptoms that diſtinguiſh it.

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[m] Mr. Conſtable of Eaſt-Bergholt, a gentleman who kept hounds between twenty and thirty years, has obſerved this, and lately diſtinctly deſcribed it to me. An opportunity has offered of my making a ſimilar obſervation, as may be ſeen hereafter.

There is indeed a ſpecies of diſeaſe claſſed under this head, called by ſome the dumb madneſs. It is certain that dogs have been affected with a complaint under which they remain ſtupid, neither with inclination to bite, nor marked with exacerbations. Doubts may be entertained however of its being a different ſpecies of this complaint. I ſhould rather refer it to a febrile affection ſimply, till its power of communicating rabies be proved. In ſome caſes of Diſſection, aſterwards to be mentioned, we find little or no affection of the tongue and lips.

The dog that bit the young lady, in September 1795, at Ipſwich, had but little increaſe of ſaliva, and ſcarcely any ſwelling about the mouth. The dog that bit Hogg[a] had no obſervable diſeaſe about the fauces, æſophagus, or larynx; the ſtomach was found more than half full of contents ſmelling like human fæces.

We have mentioned already in the hiſtory of the ſymptoms, that the diſeaſe attacks by fits, having intervals and exacerbations. In the latter he is furious to a degree, and it is at this time, for the moſt part, that he flies on whatever preſents itſelf to him, and bites unprovokedly. Other ſymptoms might be added, but the above appear ſufficiently pathognomonic.

In order to render the hiſtory ſtill more perfect the following caſe is narrated, where it was traced by myſelf with care, from the bite and firſt approach of the ſymptoms to their termination.

The ſummer of 1795, eſpecially from the middle of July to the equinox, proved uncommonly warm and dry. In the courſe of theſe nine or ten weeks, the thermometer, frequently in the middle of the day, ſtood at 80 and upwards in the ſhade, in a northern aſpect; and

during

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[a] Vide Medical Commentaries, dec. 2. vol. 10.

during this time there was ſcarcely any rain. Whether this had any influence in producing rabies among dogs ſhall not in this place be diſcuſſed; but ſo it came to paſs, that about this time the town and neighbourhood of Ipſwich was much infeſted with, and alarmed by theſe animals under this diſtemper.

The firſt we heard of them was in July in the camp at Landguard-Fort, diſtant about fourteen miles, where one appeared, and bit ſeveral dogs, which was the occaſion of many being ſhot. For the ſame reaſon many were deſtroyed in this town. A little ſpaniel bitch accuſtomed to the parlour, and the plaything of the children in a family of this place, had contracted the diſeaſe; but how, or when, or whether it was bitten could not be traced; hence unſuſpected it bit a kitten, one of the children four years and two months old, and a pointer puppy in ſucceſſion, before it was known the animal was infected.

The kitten was bitten on the Saturday morning at ſeven, and ſo ſeverely that it was judged proper to deſtroy it. The young lady was bitten very ſlightly on the edge of the upper lip and near the lower corner of the ala of the right noſtril, about five in the afternoon of the ſame day, Auguſt 29. In the interim the bitch ſhewed no ſymptoms whatever of irritability of temper, allowing a perſon to open her mouth, into which he introduced his hand for a proof to the alarmed family, that a dog who would ſuffer this familiarity, could not, as he affirmed, be mad. It was the next day, Sunday, about nine in the morning, when ſhe bit very ſeverely the pointer puppy on the upper lip, ſo as to cut it through. Between ten and eleven on the Tueſday following, the ſpaniel bitch died on the chain, and ſeemingly without a ſtruggle. The puppy which had been bitten, and was near a year old, was, on this, immediately chained, and continued ſo till about ten o'clock, September 22, when he expired under rabies.

It ſhould have been mentioned in its proper place that the bitch was remarked to be indiſpoſed on the Friday, the day before the kitten and child were bitten. This obſervation was made by the ſervant, whom ſhe followed that forenoon. He took notice of her occaſionally running in a zig-zag direction, and grunting in an unuſual manner, but without any marks whatever of ferocity.

The ſame day, Saturday, that the kitten was bitten, the bitch followed her miſtreſs up the ſtreet to a houſe where ſhe went to pay a viſit, calm and compoſed. During her miſtreſs's ſtay in the family ſhe laid down and ſlept by her ſide, but was obſerved to be more convulſed, (in a dream as ſuppoſed) than common. On returning home ſhe ran in the ſame manner, as the ſervant had obſerved, zig-zag down the ſtreet again grunting. Still no ſuſpicion was entertained of madneſs; and theſe circumſtances were only recollected afterwards.

It is evident from the above hiſtory, that the madneſs of this animal returns after certain intervals, reſembling what we obſerve in the human ſpecies, and that it is during the fits only that it ruſhes on and tears whatever oppoſes it. We have ſeen that a fit came on early on the Saturday morning, which was the firſt they obſerved, and that the kitten being in its way was the immediate object of its fury, which in this inſtance was very great. From this till five in the afternoon, its intervals ſeemed to be tolerably compleat, unleſs as far as the zig-zag movement and grunting along the pavement, and the convulſive dream indicated indiſpoſition.

At this period a ſlight return appears to have taken place. For the ſmall and trifling wound now given the child during her walking in the garden, (as it followed) is an evidence. It did not tear her as it did the kitten in the morning, but left her the moment it gave the ſnap, on the child's crying. Its fury did not continue, being gentle immediately after, ſuffering them to fondle it as uſual.

Though the attention of the family was now naturally directed to the child, they were not prevented from obſerving this; and though a conſiderable alarm was created, yet it was removed in ſome degree by this conſideration; and by ſuppoſing that the child might have laid hold of the bitch, playing with her in her uſual manner, (being a parlour favourite) might perhaps have pinched her ears, or trampled inadvertently on her tail. This was a natural reflection; and, after waſhing the child's wounds with ſome cold water, ſoothed them for the night. Next day, Sunday, however, we obſerved another fit return with ſtill greater violence and fury. The whelp above mentioned, paſſing by at that time, being the neareſt object, became its victim; ſhe darted upon it, caught it by the upper lip, cut it through and through, keeping her hold till the pup was forcibly dragged from her, by a ſervant who ran to its aſſiſtance. She was now tied up, and the fit ſubſiding, ſhe became compoſed as before, and meat and drink, which ſhe did not refuſe, w~~as~~ere ordered for her as uſual. Nothing remarkable was obſerved from this time till the Tueſday morning following, when ſhe died, unleſs ſome uneaſineſs and howling, during the night, which was attributed to her being chained.

There was little or no ſaliva obſerved to flow, compared to what authors have ſaid, who have written on the ſubject; no frothing at the mouth. The lips, however, were conſiderably protruded and ſwelled; and more moiſture hung about the corners of the mouth than is ſeen in health. Upon the whole, there was enough to juſtify the idea that all authors have given, of an increaſed ſecretion iſſuing from the mouth. She did not loſe her recollection of the family, but wagged her tail and ſeemed to fawn on them as uſual, when they approached, till the evening before her death. One of the maid ſervants went to her on the Monday afternoon, while on the chain; took her in her arms and fondled her, while ſhe returned her careſſes by every external mark, as in health.

We ſee here a perfect hiſtory of this diſorder as it appeared in this individual animal;

and we ſee farther, that the period it takes to run its courſe, is nearly the ſame with that which has been aſcertained in the human ſpecies, dating from the ſymptom Hydrophobia. The firſt appearance of the diſeaſe was on the Friday, and the ſcene terminated on Tueſday morning, compriſing a period of between three and four days.

The puppy was tied up on the death of the other, and fed as uſual. This was September 1. On Sunday, two days before, as we have ſeen, he was bitten: he continued in perfect health, bearing his chain with eaſe, eating, drinking, and paſſing his different excretions in a healthy manner, till Saturday the 19th, or the twenty firſt day from the bite. He was now obſerved to be ſick and vomit his food, but did not abhor water. His eyes appeared inflamed, yet rather dull and heavy, than furious. That night he became very uneaſy on his chain; howled, making a melancholy and unuſual noiſe, which greatly diſturbed the family, and renewed their apprehenſions for the ſafety of the child[*]. On

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[*] It is with great ſatisfaction I mention the young lady's eſcape from the malady. Whether this was owing to the inſuſceptibility

Sunday the 21ſt. he became furious at times; was obſerved to paſs neither urine or ſtools this day, champed and tore into bits a roll of brimſtone which had been thrown into his water, toſſing them to a conſiderable diſtance around. Nor did he ſeem afraid of the whip when cracked before him, from which he uſed to fly with precipitation; neither did he know at this time, his maſter's voice, who ſpoke to him in his uſual manner.

On Monday the 21ſt. the creature's fury was increaſed; he bit at his chain and by violence broke looſe, ruſhed into the ſtable where two ſervants were with the horſes, who alarmed at the ſight, climbed up into the hay-loft, *they don't know how*, (to uſe their own words). The chain was luckily laid hold of by a hooked ſtick on the outſide, through an aperture between the door poſt and wall, by which he was dragged to the door, which happened then

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ſuſceptibility of her habit at the time; the fortunate waſhing with cold water, and wiping with a dry handkerchief the bleeding ſcratches, and waſhing the mouth in general immediately on receiving the bite; or to the extirpation of the wounded parts about twenty eight days after, is not material. This laſt ſtep was highly prudent, and ought never to be omitted in ſimilar caſes.

then to be ſhut. The perſon who accompliſhed this, held him with all his ſtrength ſo that he could not move his head till the ſervants deſcended, procured another collar, put it over his head and thus ſecured him. This operation conſumed near three hours, and required caution and dexterity for the ſafety of thoſe concerned in it, but it protected both the men and horſes from their impending danger.

As the animal was obſerved neither to paſs ſtools nor urine the preceding day, two ſmall balls of mercury and tin were given as a purge, which its maſter had been in the habit of adminiſtering to his dogs occaſionally, and which had the deſired effect. He champed and readily ſwallowed them when thrown on a plate before him, but paſſing another reſtleſs night in the manner already deſcribed, howling and diſturbing the family, he died next morning, (the 22d.) apparently without a ſtruggle.

It deſerves notice, that in this caſe alſo there was little or no increaſed quantity of ſaliva ſecreted, nor frothing at the mouth; but in the courſe of the laſt day the tongue was ſomewhat ſwelled, which ſeemed to be the chief cauſe of impeded deglutition that day, but there appeared no horror whatever to the water, as he neither fled from, nor ſhunned the veſſel which ſtood by and contained it.

We ſee in this ſecond caſe, a period from the commencement to the termination of the diſeaſe almoſt exactly the ſame with that of the firſt: we perceive alſo a train of ſymptoms ſo ſimilar in the two caſes, that we may fairly draw a hiſtory of the diſeaſe in this animal from them. We can in this laſt caſe mark the exact period from the bite till death, a thing which hitherto has not been ſo accurately aſcertained; but whether it be the ſame in every other caſe, we ought not raſhly to conclude. Conſtitution may produce variety[p]. In a third caſe which I have had an opportunity of ſeeing in this animal, the period was nearly the ſame; but to elucidate the hiſtory ſtill further, I inſert the following, where other things worth notice will be found.

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[p] Hugo Meynell, Eſq. places fourteen days as the ſhorteſt and eight months the longeſt interval, from his own obſervation *, between the communication of infection and the commencement of the diſeaſe in the dog. Whatever this gentleman ſays reſpecting dogs will have great weight, when the attention he has paid to the habits of this animal, and the conſequent prevention of diſeaſe for many years, among his pack, are conſidered. I am aware of the raſhneſs that may

* Vide Mancheſter Memoirs, vol. 4. part 2. page 468, note.

This is from a caſe of Hydrophobia communicated by Mr. Alexander Johnſton, Surgeon ~~of~~ at Dunbar[q]. There is here the inſpection of the ſtomach of a rabid dog, immediately after being killed. The animal ſeized a man named Thomas Hogg, without any previous notice by barking or otherwiſe, The calf of the leg was the part wounded; Hogg with great reſolution laid hold of his jaws, and would not quit them till the dog was killed, which was done by a perſon at his entreaty, coming up at that inſtant; ſaying, with a noble humanity, as for himſelf he could not be worſe, but that if he let him go, others might ſuffer. This happened on December the 13th, 1793. "Having always underſtood"

attach to any doubt concerning the accuracy of that part of his obſervation, which gives eight months from the reception of the infection, (I preſume he ſpeaks of the inoculated) to the commencemet of the diſeaſe. I do not deny the poſſibility, but it does not accord with what has fallen within my own knowledge, nor with anſwers I have received from various ſources to enquiries on this head. Might not this have happened from a ſecond infection unobſerved by Mr. M.?

[q] Vide Medical Commentaries, dec. 2. vol. 10. 1795.

ſtood" ſays the author, " that a dog labouring under Hydrophobia would neither *eat* nor *drink*, the ſtomach was inſpected and to our joy we found it more than half full of *food*[r], which had a corrupt and diſagreeable ſmell; inſomuch that we conjectured the animal had been eating human fæces." There was nothing particularly obſervable in the mouth and fauces.

We would only here deſire the reader to notice the affection of this organ. He can have no heſitation in pronouncing it the chief ſeat of the diſeaſe, including perhaps part of the inteſtinal canal. Nothing is ſaid of the condition of its coats; whatever they may have been, a ſeptic [illegible] tendency was produced to a high degree, as was indicated by the ſmell. The difficulty of deglutition ſeems to proceed from the propagation of the affection from the cardia into the æſophagus. But it does not appear that the glands deſtined for the ſecretion of the ſaliva, were much if at all affected. It would ſeem, that as the conſtitution of the dog varies, ſo are the ſymptoms modified. In this reſpect it reſembles what takes place in the human ſpecies.

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[r] The contrary was fully eſtabliſhed in the firſt edition of this work publiſhed about ten years ago. It was proved by various inſtances that this animal *can* communicate the infection a conſiderable time before he ceaſes either to eat or drink.

Upwards of a dozen dogs were bitten at the ſame time, they all died in conſequence of the infection; but there was one of them who did not exhibit the ſame ſymptoms of rage as the reſt, neither did his recollection forſake him, for a little before his death he expreſſed pleaſure at the ſight of his maſter, by ſhaking his tail. During the diſeaſe he never attempted to bite either animal or perſon that approached him[s].

In the diſſections of ſome dogs who have died of the malady, the appearances on the inſide of the ſtomach have been ſimilar to thoſe found in the human ſubject, as we ſhall ſee hereafter. This would ſeem to point out the ſpecific nature of the poiſon; and that this organ is the part on which it principally exerts itſelf, as the ſkin is in the ſmall-pox, meaſles, ſcarlatina, and ſome other eruptive diſorders.

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[s] Vide Tranſactions of a Society for the Improvement of Medical and Chirurgical Knowledge.

[t] Some have thought a dog under this dumb and placid madneſs, as it has been called, was incapable of communicating the diſeaſe; but two caſes to the contrary are affirmed. Vide Medical Commentaries, vol. 10. dec. 1.

Although the progreſs of the diſeaſe in the canine tribe may be called uniform, yet it is not without ſome variety; for it has been found that a dog will return after leaving his maſter's houſe, and after a fit of fury will again become quiet and peaceable towards the perſons, (thoſe of the family) at whom before he ſeemed enraged.

Since we find it invariable that the dog ſtrays from home when the diſorder is approaching its acme, it ſuggeſts a caution of the utmoſt importance; this is, never to be familiar with ſtrange dogs, and on all occaſions to approach them with great reſerve. From a number of caſes of this afflicting malady, in the human ſpecies, collected by a ſociety, whoſe aim was information relative to this, it appears that the greater number were induced from a familiarity with ſtrange dogs. In whatever degree our affection towards this animal may be expreſſed, for his attention to us in preference to his own ſpecies, yet our prudence for ſelf preſervation ſhould not deſert us.

It is a fortunate circumſtance for man, that he is not ſo liable to be infected as the dog; not more than one, perhaps, in ſixteen of the human ſpecies, who are bitten, take the diſeaſe[t]. The ſuſceptibility of the dog after a bite is diſcovered to be much greater. Four men and twelve dogs were bitten by the ſame rabid dog; all the men eſcaped, but every one of the dogs died mad. In comparing inſtances of this kind in authors, many proofs corroborating this remark, will be found. The men here uſed no other means of prevention than what we every day ſee fail[u]. To what can we attribute this? Scarcely, I think, to the greater ſenſibility of the canine ſyſtem, rendering it more eaſily infected. It muſt be to ſome other law in the œconomy of his frame.

From the above view of the malady, it will appear that very ſmall attention might prevent any accident from his bite; for in the early ſtage of his illneſs, when he lowers only and ſeems heavy, he ſhews little or no marks of a change in his temper. He neither ſnaps at, nor bites at perſons near him; and hence, in dubious caſes where prudence raiſes ſuſpicion, he might eaſily, nay, he ought to be tied up till time ſhould determine the event. Nor would this be found long; for perhaps leſs than ten days may bring the whole ſcene to a concluſion, or ſufficiently convince us that our fears are groundleſs.

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[t] Some have calculated it at one in twenty-five. On collating however a number of inſtances of bites received, the average did not amount ſo high.

[u] Vide Tranſactions of a Society for the Improvement of Medical and Chirurgical Knowledge.

But let us ſuppoſe that this has been neglected, or that the rabid animal has unexpectedly come in the way, and unhappily exerciſed his fury, too ſucceſsfully, either on one or more of the human ſpecies, or on ſome of our domeſtic animals, what then is to be done?

Before this queſtion can be ſatisfactorily anſwered, it may be neceſſary to notice two opinions reſpecting the pathology of the diſeaſe, which of late have been conſiderably agitated. The one, whether the infection acts locally and by irritation, not only on nerves but tendons, and thereby ſympathetically affecting the whole nervous ſyſtem and moving fibres, without the introduction of the poiſon into the circulating ſyſtem, or communication with the maſs of fluids: the other, whether the abſorbing veſſels, as by an univerſal law belonging to their nature, after a due time drink up the poiſonous ſaliva inſerted in the wound, and carried to the general maſs to be mixed with the blood, &c. and thereby in a ſecondary manner acting on the nerves and propagating the diſorder.

The latter has been the opinion generally received as the moſt obvious and natural; and till within a few years, conſidered as the indiſputable channel through which the venom was preſumed to be put into action. The former, however, has of late obtained many able advocates, and abſtruſe reaſoners to its ſupport. It will be unneceſſary to ſearch among authors of antiquity for the firſt movers of this opinion. It is a matter of little moment. I ſhall inſtance Morgagni and Sauvages among the moderns, where I have firſt found traces of this doctrine. In their writings on Hydrophobia they are both more inclined to view the diſeaſe as induced by an irritation communicated to the nervous ſyſtem *immediately*, than by an infected blood, through the veins, or in other words, *mediately* by abſorption.

I ſhall mention as the next, without being particular as to accuracy in this reſpect, the author of a paper in the Swediſh Tranſactions for 1777[*]. Here he concludes from the appearance of the blood drawn in the caſe under conſideration, that "the diſorder is not in the humours but in the violent agitation of the nervous ſyſtem by a peculiar poiſon which attacks the *breaſt* and *throat*." "When a fever ariſes," adds he, "it muſt in ſuch caſes be in conſequence of ſpaſms from the irritation of the arteries, as clearly happens in the ſmall pox, venereal diſorder, and after the operation of the cataract." Purſuing this train of reaſoning, he is led to make ſtrong objections to the antiphlogiſtic plan of cure univerſally adopted, and he puts the following queſtion; "Is it not deſirable for us to diſcover ſome powerful medicine for quieting the *nerves*, as would be able to queil this powerful *irritation*?" This hint on the improvement in the cure will doubtleſs be readily adopted at preſent by the favourers of either opinion. It is evident from theſe quotations, that he conſiders the irritation on the nerves and arteries as primary, and not in conſequence of the poiſoned fluids acting on them.

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[*] Vide Appendix for a Tranſlation of this Caſe.

The next whom I find treating the ſubject in this light, is M. Roux of Dijon. This acute writer publiſhed his opinion in drawing up ſome caſes of Hydrophobia for the Royal Medical Society at Paris, in the ſecond part of their Memoirs for 1783[x], or about ſix years after the former paper in the Swediſh Society's Tranſactions.

When the virus is inſerted into the wound, he is of opinion, that it is not then *altogether* venomous; yet with a tendency and diſpoſition to become ſo: and that it requires a conſiderable time before it arrives at the height of its virulence, till which it is incapable of exciting the diſeaſe. One of his principal objections to the production of the malady by a diffuſion of the virus through the ſyſtem, ariſes from the weakened ſtate which muſt ſucceed ſo great a dilution and ſeparation of its particles. He cannot conceive, how thus weakened, the venom could excite Hydrophobia. For in order to this it muſt remain at reſt, and be out of the reach of circulation or vital action, as it is expreſſed. In ſupport of this theory

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[x] In this volume of Memoirs, the reader will find ſeveral curious communications.

theory he brings forward ſeveral examples which to him are ſufficiently ſtrong to eſtabliſh it, and on which he founds his method of cure[y].

The next again in order whom I ſhall mention, as maintaining the doctrine of *primary* nervous irritation and ſympathy exciting the diſeaſe, is Dr. Percival. He does not admit the analogies between Hydrophobia, and lues, variolæ, or the poiſon of the viper, nor conſequently of abſorption, whereby the maſs of fluids are tainted. Inſtead thereof he refers the whole to local irritation, firſt communicated to the brain, and thence reflected back to the fauces[z], &c. Nervous irritation appears propagated in this manner in the aura epileptica, and this diſeaſe frequently follows ſuch a ſenſation. On this ground, ligatures which have been occaſionally uſeful, have been lately recommended in Hydrophobia, in order to arreſt its progreſs by benumbing the nerves near thoſe parts from which it is ſuppoſed to take its origin. This eminent phyſician does not ſeem entirely confident in this doctrine, for he ingenuouſly confeſſes, that "we are ignorant of the peculiar properties of the canine virus; of the *mode of its communication*; and the parts of the animal ſyſtem affected by it. Are we then qualified," ſays he, "to advance one ſtep beyond conjecture[a]?"

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[y] Vide Appendix for a ſhort Analyſis of this Paper, with ſeveral others from the ſame work.

[z] Vide Eſſay 10. vol. 2.—Hints to Dr. Haygarth.

Dr. Ruſh takes the ſubject up ſomewhat in the ſame light. He views this afflicting malady as bearing a near relation to tetanic affections. The latter is produced from wounds, from irritated nerves and tendons, affecting the organs of deglutition, producing locked jaw, &c. and ariſing alſo from other debilitating cauſes. The former proceeds from wounds, from irritation on the nervous ſyſtem, eſpecially in the ſpontaneous Hydrophobia, as in violent paſſions of the mind, from Hyſteria and other affections induced by debility. In this they bear a ſtrict alliance to one another. Inſtances are numerous where a diſeaſe in all its ſymptoms ſimilar to Hydrophobia has taken place from conflicts of the mind, and each of the ſources here enumerated; and Tetanus and Hydrophobia having

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[a] Ibid. page 315.

having changed ſides, as it were, ought to be combated, in his opinion, and it ſeems to be juſt, by the ſame ſet of remedies, viz. whatever ſtrengthens the habit and obviates debility.

Dr. Meaſe has produced his analogies from the ſame ſources, and reaſoned much in the ſame way with his reſpectable preceptor. His concluſions are, that the diſeaſe ariſes from a morbid ſtate and irritability of nerves, in the ſame manner with tetanus; and ſome of his proofs to eſtabliſh this doctrine are drawn, firſt, from ſpeedy putrefaction after death being equally obſervable in the tetanic and hydrophobic ſubject: and, ſecondly, from the occurrence of dimneſs of ſight, and even blindneſs, together with paralyſis and numbneſs of the limbs. Theſe he conſiders as unanſwerably fixing the affection in the nervous ſyſtem, excluding every idea of abſorption. According to him, there "ſubſiſts a morbid local affection of certain parts, which are afterwards rendered manifeſt on the application of particular cauſes." Theſe are the parts to which the poiſon is firſt applied. The locality of the poiſon in the part where it was firſt conveyed till the appearance of the diſeaſe will not be diſputed; but his proofs of its not entering the general habit which are brought from the bitten perſon's paſſing through other diſeaſes before the appearance of Hydrophobia, may not to all be ſo concluſive: they may admit of an explanation on different grounds.

Dr. Bardſley, in his feelingly deſcribed caſe of the unfortunate Lindſey, has given us an excellent epitome from various authors of caſes reſpecting this diſeaſe, and has brought together ſeveral ſcattered facts, relative both to the ſpontaneous, and inoculated ſpecies. His ſentiments reſpecting the manner in which the diſorder ariſes, evidently lean to the ſame ſide. From inſtances quoted he concludes, and certainly his reaſoning bears with it much weight, "that the occaſional cauſes productive of ſpontaneous Hydrophobia," (he is chiefly inquiring into this) "operate either *locally* or *generally* upon the nervous ſyſtem, by increaſing its irritability, and at the ſame time inducing debility. It is alſo ſufficiently evident," adds he, "that the action of the canine poiſon produces ſimilar effects. But its ſuperior miſchievous activity, in compariſon with any other occaſional cauſe, cannot be denied. Yet I apprehend we ought to attribute the more fatal virulence of the canine poiſon, rather to the *difference* in *degree*, than to the *nature* of the cauſe. For undoubtedly, the *identity* of *effects* warrants the concluſion of an *identity* of the *cauſe*."

Dr. Darwin, the lateſt author on this ſubject[b], appears an advocate for irritation. From a difficulty of deglutition induced by wounds of different kinds, eſpecially in tendinous parts, ſoon after infliction, he ſuppoſes that Hydrophobia ariſes from diſeaſed tendons merely; and therefore bearing a ſtrict analogy to tetanus. Several caſes of this kind are on record, where Hydrophobia ſtrictly ſo called, and death has ſucceeded wounds from nails, from ſplinters of wood, from the ſplinters of a fractured bone pricking neighbouring parts, &c.

He allows alſo a ſecond analogy equally ſtrong, viz. that which ſubſiſts between it and the diſeaſe occaſioned by the bite of a viper and other poiſonous reptiles, both ariſing from the inſertion of a ſtimulating fluid into a wound. In its rapid progreſs and ſpeedy termination, it has, according to him, a ſtrict ſimilitude likewiſe to contagious fevers[c]. To each of theſe we admit the analogy; but the firſt would appear a diſtinguiſhable caſe from the ſecond. The early commencement from the application of the cauſe in hyſteria, &c. forms a marked difference; and difficult deglutition alone muſt not be conſidered as pathognomonic. The ſecond and third analogies appear more applicable to rabid Hydrophobia, and bear to it a ſtrict relation.

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[b] Vide Zoonomia, vol. 2.

With reſpect to diſeaſed tendons in conſequence of a bite from a rabid dog, exciting Hydrophobia, it may be obſerved, that ſuch bites are not always received in tendons or tendinous parts. They are as often inflicted in muſcles merely, as otherwiſe, and at a diſtance too from their inſertions; therefore, there will be difficulty in admitting diſeaſed tendons univerſally as a cauſe. I am inclined to think, this reſpectable author, from the analogy he admits between the diſeaſe produced by a rabid dog, and that from the poiſon of venomous animals, is himſelf uncertain reſpecting local irritation independent of the excitement of the malady by abſorption. Be this as it may, his plan of cure which is to obviate debility, founded upon principles ſimilar to thoſe of Percival and Ruſh, merits the practitioner's attention.

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[c] As Hydrophobia "happens in *ſome* hyſterical caſes; hence it ſeems rather the immediate conſequence of a pained tendon, than of a contagious poiſon. And is ſo far analogous to tetanus, according with the opinions of Dr. Ruſh and Dr. Percival."

"In other reſpects, as it is produced by the ſaliva of an enraged animal inſtilled into a wound, it would ſeem analogous to the poiſon of venomous animals. And from the manner of its acceſs ſo long after the bite, and its termination in a ſhort time, it would ſeem to reſemble the progreſs of contagious fevers." Zoonomia, vol. 2. page 347.

Dr. D. aſks here a very pertinent queſtion; whether the cardia be not the ſeat of Hydrophobia[d]. He refers this to aſſociation; as in cardialgia the pain is felt in the pharinx though the irritation by the acid materials is given at the other end of the tube, or mouth of the ſtomach.

Without dwelling farther on the ſubject of primary and local irritation, let us take a ſhort review of the ſecond opinion, viz. of *abſorption* of the poiſoned ſaliva, and the general infection from thence of the ſyſtem, in conſequence of which the nerves are *ſecondarily* thrown into inordinate actions giving birth to the malady.

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[d] "Is not the cardia ventriculi the ſeat of this diſeaſe?" Vide Zoonomia, vol. 2. page 158.

I ought to apologiſe to the medical reader, for the introduction of the following ſhort anatomical ſketch of the abſorbing ſyſtem, ſo well underſtood by him, that barely to mention the word is ſufficient. My readers, however, will not be all converſant with medical ſubjects. To accommodate ſuch, therefore, I would beg leave to premiſe, that there are, as forming a part of the animal machine, a ſeries of veſſels, termed lymphatics or abſorbents. Theſe are diſperſed plentifully over every part, as well external as internal. Their uſes are to ſeparate the nutritious part of the aliment from the feculencies. By this means it is conveyed to the blood, and circulates with it, where it is again farther elaborated into fleſh, bone, cartilage, tendon, ligament, &c. by the different organs adapted by nature for making theſe new combinations. They drink up, in like manner, the ſuperfluous lymph left in cavities, &c. where it has been depoſited by another order of veſſels, named exhalents, and brought hither by them for uſeful purpoſes. The abſorbents alſo open numerouſly over the external ſurface of the body in all animals, the dog tribe not excepted, though with ſome difference in this claſs. This is abundantly proved from the inhalation of fluids, whether watery, or elaſtic and aerial, applied externally to the ſkin. Inſtances of the one we have by the abſorption from the atmoſphere which takes place in diabetes; while Mr. Abernethy's[e] experiments are ſatiſfactory with reſpect to their taking in elaſtic gaſes. Subtile effluvia do not eſcape them. Thus, we find the ſtrong ſmell of garlic in the urine ſoon after a plaiſter of the ſame is applied to the external abdomen; and a violet ſmell is ſoon perceptible in the ſame ſecretion, communicated to it through the intervention of the abſorbents, after oil of terebinth has been kept for ſome time in contact with the external ſurface, eſpecially of the part already mentioned.

As we cannot wound the ſmalleſt portion of the ſkin without opening ſome of theſe, whatever comes in their way ſufficiently minute to circulate in them, is drank up, and, by the aſſiſtance of valves with which they are furniſhed, carried onwards to a general receptacle;

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[e] Vide Eſſays, Surgical and Phyſiological.

ceptacle; thence paſſing through it, mount, like water in a common pump, to a vein under the left clavicle, dropping with its contents immediately into the heart, mixing with the maſs.

It is by the intervention of theſe we can ingraft diſeaſes, ſuch as the ſmall-pox; it is by theſe, the venereal poiſon, that juſt tax on the illicit commerce of the ſexes, as well as ſeveral other infectious maladies, is received, contaminating the body and enfeebling the conſtitution. In like manner, the introduction of the poiſon from rabid animals has been hitherto explained by ſeveral of the acuteſt pathologiſts of the preſent times.

From this ſhort ſketch of the ſtructure and offices of theſe veſſels, and according to the view here given, it will readily appear, that whatever is preſented to their mouths, be it nutriment or poiſon; be it lymph or gas; they will, after a certain time, proportioned and determined by the ſpecies of matter to be received, drink it up: and it is likewiſe evident, that if their contents can be intercepted in their paſſage towards the heart, whether they be nutritious or poiſonous, and the ſeeds of future diſeaſes, the effects muſt be prevented. This admitted, we have found a clue to guide our way.

It is no eaſy taſk to determine *à priori*, the exact time that the rabid, or indeed any other poiſon remains local, or when it moves forward, rendering it impoſſible to arreſt its progreſs. This depends on a variety of circumſtances; among others, on the ſtate of the habit at the time to receive it; but principally, perhaps, on the nature of the poiſon itſelf, which is to be known only by multiplied obſervation.

The ſtate of the body at the time when a poiſon, or the ſeeds of this, or other infectious diſeaſes are received, has, indeed, very great influence. Many, on this account, independent of other cauſes, eſcape while this condition of the habit continues. This invigorated ſtate, to which we may give the name of *inſuſceptibility*, though the poiſon be conveyed to the blood, prevents its action; but a contrary ſtate or a weakened energy, which may be denominated *ſuſceptible*, more readily admits the impreſſions of the noxious matter, and a diſeaſe ſoon becomes excited. In theſe two oppoſite conditions, ſome ſubſtraction or addition would ſeem to have been made, giving a new form, perhaps, to the nerves and moving fibres.

A practical Phyſician has many opportunities of aſcertaining this fact. Perſons themſelves have aſſured me of the anxious wiſh they entertained, before inoculation was common, to paſs through the ſmall-pox, and that they took pains, and thoſe not ſmall, to catch the diſtemper, yet at that time they eſcaped; and though expoſing themſelves repeatedly to the infected, the habit, reſiſted the poiſon. It was years after this before they caught the diſeaſe, and then knew not how they became affected.

A Clergyman in this neighbourhood, frequently went to a houſe where the diſeaſe raged, and raged too with conſiderable ſeverity. He laid his hands on the infected perſon, and took ſome of the pus on his fingers; he wiped his face with a handkerchief which was on the bed, and which the perſon under the diſeaſe had uſed; he ſmelt to the linen, and took the patient's breath even into his mouth. All did not at this time induce the complaint;

ſeveral years afterwards the diſeaſe ſeized him, and at a time it was not in the neighbourhood, when he ſuffered ſeverely[f].

It is the ſame with other diſeaſes. The habit is found ſometimes to reſiſt thoſe of the moſt infectious, and virulent.

What the ſtate of body exactly is that gives riſe to this inſuſceptibility at certain times, cannot, I apprehend, be eaſily explained. Is it connected with a high degree of excitement of the ſyſtem; or in rigidity of fibre? Maniacs, I believe, are not ſo ſubject to fevers of a contagious kind, as thoſe whoſe bodies are in a different condition, and their mental faculties in health. During this derangement of the mind, their bodies are in a high degree excited; their ſtrength is augmented five fold; they can bear hunger and cold, and all other debilitating cauſes, to an extent that would prove fatal to perſons of ſound mind.

Strong affection alſo and attachment would ſeem to induce this change, and create this inſuſceptibility. It endows the perſon under its influence with a kind of heroic, I had almoſt ſaid, ferocious courage; fear is baniſhed, and ſelf preſervation diſregarded. When the object of attachment is in danger, they will ruſh forward to afford protection with unreſtrained impetuoſity, forgetful of their own fate. This produces a high ſtate of excitement for the time. We ſhall illuſtrate this by the following example.

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[f] This relation I received from himſelf. He had not been out of the pariſh, nor had mixed in company with ſtrangers for a conſiderable time before.

In the year 1636, when the plague raged in Holland, a young girl, as we are told, fell ill of the diſeaſe. She had three carbuncles, was ſuppoſed irrecoverable, and was therefore removed to a garden to die; but here ſhe was not abandoned. A faithful lover, a young man to whom ſhe had betrothed herſelf, accompanied her, and acted as her nurſe; nay more, ſays the account, he ſlept with her as his wife. She recovered, while he remained uninfected, and was afterwards married to her[g].

A ſecond inſtance where a ſenſe of duty baniſhed fear, and determined reſolution gave tone and vigour to the ſyſtem, and it would appear occaſioned an eſcape from the plague, is afforded by the following fact. When the ſame

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[g] Vide Miſc. Curioſ. ar. 2. obſ. 188. The anecdote is there related by Vinc. Fabricius.

ſame diſeaſe ſpread laſt over Marſeilles, a number of dead bodies were heaped together in a certain part of the city. To prevent the putrid odour which exhaled from them, and hourly ſpread the contagion, the governor, a man of great humanity, regardleſs of his own ſafety, but anxious for that of his fellow citizens, reſolved at all events to remove them. For this purpoſe he ordered a deep pit to be dug for their inhumation; then marching forth at the head of eighty grenadiers, ſet the example himſelf by dragging the firſt body into the pit, where in a ſhort time, theſe maſſes of corruption were all depoſited. During this operation, eight of the men died on the ſpot; at night they were all dead but one; the eightieth ſurvived only a few days. The governor, however, who, like another Decius, had bravely expoſed his life, remained uninfected[h]. Did not the fortitude which animated his noble mind communicate to his body this inſuſceptibility to the infection?

In the caſe of the Clergyman juſt narrated, we have ſeen this inſuſceptibility; and in various inſtances in the inoculated ſmall-pox, a practice in which I have hitherto been much engaged, I have found it well exemplified. In one perſon the inoculated part would not inflame, but healed up like a common cut; in another, the infection from the ſame pock, would at once take effect. Sometimes the matter has been inſerted three different times before it ſucceeded, and in ſome caſes did not ſucceed at all, though the reſt of the family regularly went through them. Several of the female nurſes, who attended my patients, have obſerved to me, that they had long nurſed in the diſeaſe before inoculation was in uſe; and that they did not ſhun communication with the diſeaſe though they had not paſſed through it; but have nurſed for years without being infected, and continued the buſineſs from an idea they would eſcape it, for this is the caſe with ſome; yet afterwards they unexpectedly fell ill and paſſed through the complaint. In one caſe I inoculated three different times, and it was fourteen days after the laſt inſertion before the eruptive fever commenced.

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[h] Vide Medical Commentaries, vol. 4. page 372.

Others have likewiſe obſerved this temporary inſuſceptibility. Mr. Loftie ſpeaks of a child at the breaſt, who for a fortnight and more was in the ſame room where four or five children were ill, and ſome of them with the confluent kind; yet at this time it eſcaped the diſeaſe.

Debility, for the moſt part, however, is the nurſe of infection, eſpecially of ſuch as gives riſe to fevers of the putrid type. A perſon in this ſtate of body is more liable to be infected than one in a contrary condition[i]. The ſame obſervation holds in fevers ariſing from marſh effluvia. Valetudinarians, when expoſed to marſhy ſituations, ſeldom long eſcape; the ſtrong may at laſt ſuffer, but they are proof againſt the effluvia much longer. This is too well eſtabliſhed to be controverted, but how far will this hold in the caſe of poiſons from noxious, or rabid animals? Many concurring circumſtances may take place to accelerate, or retard infection; and peculiarities of fibre at the time of the inſertion of any poiſon, is ſufficient to impede or obviate its operation, to a certain degree, as has juſt been ſhewn.

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[i] If it could be abſolutely proved that the addition of oxygene communicates vigor and *vice verſâ*, an explanation would be immediately afforded. It certainly gives the red colour as well as heat to the blood, and this laſt is as certainly connected with vigor. If we abſtract oxygene, or in other words, prevent its entrance into the body, the pulſe is rendered leſs frequent and leſs ſtrong. This fact Dr. Beddoes, (ſee his Conſiderations, part 5.) proves by a ſimple experiment. Breathe as ſlowly as poſſible without giving great uneaſineſs, taking at each inſpiration only a very ſmall portion of air into the lungs. Examine the pulſe during this operation, and its leſs frequency as well as weakened pulſation, is diſcovered. Here, as a ſmaller quantity of air is admitted, a proportionate ſmaller quantity of oxygene likewiſe enters; leſs heat muſt be evolved, and the pulſation affected in conſequence. Depreſſion of ſpirits weakens the habit. In this ſtate the blood circulates ſlower and leſs freely. Hence the deep and involuntary ſigh or enlarged inſpiration, which for a time removes the uneaſineſs. Under the influence of this condition, leſs air is inſpired and leſs oxygene; but the deep ſigh which gives an additional quantity for a moment, and for a moment alſo removes the impediment to circulation or adds a momentary vigor to the heart

Experience teaches, that different poiſons require different periods of time before they exert their force. But theſe periods, allowing for idioſyncraſy, or habit of body when received, are pretty regular with reſpect to the ſame poiſon. Thus, the ſmall-pox, for the moſt part, appears from the eighth to the tenth day after inoculation; the poiſon abſorbed from unclean embraces has likewiſe its period, allowing for the ſtate of the body at the time of

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heart to impel the blood forward. Fear induces a depreſſion of ſpirits, and fear is a well known exciting cauſe of diſeaſe. Hilarity, or an oppoſite condition, is an equally well-known reſiſting cauſe. Under this ſtate, both freer and quicker inſpirations are made, and more oxygene, with more heat, is added to the blood and greater vigor to the body.

of its application. It appears, that the ſame mode of reaſoning may be adopted in explaining the action of rabid poiſon at different periods from reception. If we average from a ſufficient number of caſes, and there are enough on record for the purpoſe, the reſult will ſhew a period from five to ſix weeks from the accident, to the firſt intimation of the approaching diſeaſe.

It would, I think, be no uſeleſs labour to form a ſcale of the virulence of different infections by marking the diſtance between the time of expoſure or contact, to the appearance of the firſt ſymptom of the reſpective malady; in tracing this we ſhall find a vaſt range between the moſt powerful and the weakeſt infections. The poiſon of ſome venomous reptiles act almoſt inſtantaneouſly; and the interval between the inſertion, the firſt ſymptom, and the fatal termination, has been but a few minutes. Others of a leſs powerful nature have exerted little or no influence till after ſeveral hours; others not till ſeveral days; while others again have been protracted to months, and even to a year and ſomewhat upwards. It is ſcarcely neceſſary to add, that by the laſt I mean the rabid poiſon. Chiſholm has ſtated the diſtance between the application of the infection in the yellow peſtilential fever at its lateſt period, making allowance for temperament, not to exceed four days till the firſt ſymptom manifeſted itſelf. "In ſome inſtances," ſays he, "ſymptoms of its action have appeared in ſix hours; in others, in twenty hours; in others, in forty-eight; and in others, not till the expiration of the fourth day." This ſpecies of infection I conſider as amongſt the moſt powerful.

We may obſerve here another inſtance of conſtitutional retardation, or the effects of that ſtate of body under which the individual laboured, giving a variation, and latitude of action to the ſame poiſon from ſix hours to four days. Will not this analogy aſſiſt in explaining the difference of time neceſſary in different individuals, to bring the rabid virus into action, or fit it, as ſome would argue, for abſorption?

Contagion of the plague, according to Dr. Guthrie, appears about the fourth day from contact; he draws his concluſion from the inſtances he received of it from the Ruſſian army. In the ſmall-pox, the inoculation of which enables us with preciſion to mark the period, the diſtance is from the inſertion to the firſt ſymptom nine days, at a medium; but by habit and temperament it varies, on ſome occaſions, to fourteen. When this diſeaſe is received in the natural way, without the intervention of a wound, the firſt ſymptoms appear ſome days later; ſeldom if ever before the fourteenth. In other contagious diſeaſes there appear likewiſe to be periods peculiar to each, giving to each individual its ſpecific nature and diſtinction.

A young patient was removed for ſafety to the diſtance of eighteen miles from his brothers and ſiſters, who were ill of the ſcarlet fever. About ten days after he took the diſeaſe. None were ill of it in the place to which he was removed, nor had been for a long time, perhaps years, before. He muſt therefore have received the infection previous to his removal. It is evident from thence that the infection of this diſeaſe, is latent about twelve days before it comes into action; for the diſeaſe had but juſt become manifeſt, when, from the alarm of the family, the boy was ſent from home.

Dr. Ruſh, who is inclined to think, that conſumption is infectious, ſtates the period between the time the matter was firſt received, and the beginning of the diſeaſed action in the habit, to be about three months. If I am right in my conjecture, that poiſons act ſooner or later according to their ſpecific nature, and the ſtate of the habit to be acted on, then conſumptive infection muſt be at leaſt as weak as the canine poiſon; for the latter is frequently brought into action, as we ſhall ſee hereafter, at a much earlier date.

Some perſons, we know, after receiving the canine virus, have continued well to a much later period. This may be referred to a peculiar ſtate of body at the time, as we have ſeen in other poiſons; but I deny the exiſtence of any well-authenticated caſe in the records of medicine, where years have intervened. When we meet with ſuch ſtories in authors, we may fairly treat them as fabulous. Opinions of this kind have done great miſchief, both to individuals and to ſcience; things ſhould be well examined before they are admitted as truths. It is well known, that many opinions in medicine were taken up by men eminent, it is true, in their day, and therefore had ſome authority ſtamped on them; but which were opinions merely, not only without facts, but almoſt probability to ſupport them; and thus ſeveral of them have for generations, and do even at this day, in ſpite of the advanced ſtate of ſcience, prevail. They were produced by chance; and we ought to remember, that they were diſſeminated in times of obſcurity.

If to theſe poiſons, likewiſe, under different circumſtances, we allow different degrees of virulence; this, united to the ſtate of body, idioſyncraſy, or conſtitution already mentioned, will aſſiſt in forming the variations we obſerve relative to the propagation of their reſpective diſeaſes. There is a period of the ſmall-pox, at which the matter is found more infectious, i. e. more apt to come into action than it is at another, as is well known to thoſe accuſtomed to ingraft the diſeaſe. There is a time alſo, perhaps, when the ſaliva of an infected dog is tainted with a higher degree of virulence than it is at another. Something in the variety we obſerve in the ſymptoms both of the dog and animals he infects may be placed to this account, as well as to conſtitution. Whether this be the laſt ſtage, I dare not ſay; but we ſee in this ſtage that the ſaliva is ſecreted in ſomewhat greater abundance.

dance. This would be a fact worthy of aſcertaining. We know indeed that they can infect when no preternatural quantity is ſecreted, and at a very early period of the complaint. We more certainly communicate the ſmall-pox on the firſt days of the eruption. Whether this be, that the ichor is more virulent, or that it is now only leſs involved in mucus and glutinous particles than at a later ſtage, eſpecially at the turn of the pock, has not, I believe, been poſitively aſcertained; or whether, as ſome later experiments ſeem to indicate, the quantity, or dilution of the pus, affects the quantity of future puſtules, and the mildneſs of the diſorder[l]. In the caſe of poiſon from venomous ſerpents this holds true. Dr. Barton[m] has inſtituted ſome experiments on the poiſon of the *crotalus horridus* (rattle ſnake), to which the reader is referred.

In the ſeaſon of langour and torpidity, this ſerpent, he tells us, bites with ſeeming reluctance, and without any, or with but little ill conſequence. But when the ſeaſon is advanced, and the ſun powerful, it bites with virulence, and deſtroys life in a ſhort time. It is even often found, that at this time the cavities of the venomous fangs are deſtitute of their active poiſon; the ſame moſt probably happens from their frequency of biting, which exhauſts the venom faſter than it is ſecreted; and indeed this is fully proved by the Doctor's father[n], at Philadelphia.

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[l] Vide Beddoes' Conſiderations.

[m] Vide American Philoſophical Tranſactions, vol. 3.

He procured a live rattle-ſnake, and by a ſtring ſo managed it, that he could lead it into or out of the cage in which it was kept. On the firſt day, he ſuffered it to bite a chicken, which had been allured to the mouth of the cage by crumbs of bread. In a few hours, the bird mortified and died. On the ſecond day, another chicken was allured to it, and bitten in the ſame manner; it ſurvived the injury much longer than the firſt. On the third day the experiment was repeated on another chicken; it ſwelled much, but recovered. On the fourth day ſeveral chickens were bitten without ſuffering the leaſt injury. Dr. Mead, in examining into the poiſon of the viper, diſcovered this difference alſo in degrees of its virulence; and attributes it very properly to the ſtate of the animal combined with the ſeaſon of the year. The rage of the reptile has no other effect than to cauſe it to inflict a wound with greater force.

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[n] The M. S. account of theſe, is it ſeems, in his poſſeſſion.

But to return to the action of the abſorbents; they perform their office, it is true, with celerity, yet from what we have advanced before, it is apparent, that the celerity of their action varies with the nature of the poiſon; it varies, likewiſe, in what relates to the habit; and it *may* vary, alſo, according to the mode in which it is inſerted. Should it be thrown directly into the mouths of ſome of them, which is what may happen, its entrance into the blood will be ſpeedy. And ſhould they be expoſed to moderate cold[°], or any ſtimulant ſubſtance be applied to them, their propulſive power may be encreaſed, and the rapidity be the greater.

Facts do not go, however, to prove this ſuddenneſs of abſorption in any well-atteſted caſe of Hydrophobia. It is always latent a certain time; yet we may ſuppoſe that in moſt caſes it is in contact with the open mouths of lymphatics. We have ſeen that other ſpecific poiſons remain latent in the ſame manner: a certain time ſeems neceſſary to fit them for abſorption. I ſpeak chiefly now of the ſmall-pox and venereal poiſons. Among the animal poiſons

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[°] Great cold benumbs them and retards their action.

poiſons there ſeems to be a ſtrict analogy; and perhaps by well inveſtigating the nature of one, we inveſtigate the nature of all.

Does the diſtilled water of the laureo-ceraſus act by abſorption? Dr. Nichols found that it killed a dog in leſs than half a minute. This would appear to be ſooner, perhaps, than it could be conveyed by the abſorbents to the ſyſtem.

Dr. Madan found this vegetable poiſon prove fatal in a few hours; and this took place whether applied to the ſtomach, or thrown up the rectum by clyſter[p]. As its effects appear ſo ſpeedily, either after being ſwallowed, or injected *per anum*, its powers muſt be exerted on the nervous ſyſtem as ſpeedily; but whether without the intervention of a ſet of veſſels to convey it to the general maſs, I would not affirm. The inner ſurface of the ſtomach is, indeed, thickly covered with *nervous filaments*, and the ſenſibility of this organ is thereby rendered extremely acute. A poiſon, on touching theſe, may give ſo great a ſhock, that the whole machine may inſtantly partake of it, and from this alone death follow. This ſeems to have been the caſe with the rabbit in the experiments of Fontana[q], the death of which inſtantly ſucceeded the poiſon of the viper, when injected into the jugular vein.

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[p] Vide Wilmer's Obſervations on Poiſonous Vegetables.

An infectious irritation, like others, requires time before it affects the reſiſting and aſſimilating powers, ſo as to produce the ſpecific ſtate of veſſels and ſpecific matter[r]. This by *no means* goes to exclude the poſſibility of abſorption, or to deprive this ſet of veſſels, ſo uniform in their operations in the animal œconomy, of a part in the proceſs of conveying this, or other poiſons, to the habit, provided they find not a readier or more expeditious way of entering.

It is clearly evinced, and beyond the poſſibility of doubt, that there is in them an active power, diſpoſing them to lay hold of things, if ſmall enough to enter their mouths, the virus of rabid animals as well as other matter. And to prove that this virus is abſorbed in the manner we have endeavoured to deſcribe, we ſhall bring a clear analogical argument from the ſmall-pox.

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[q] Vide Fontana on Poiſons.

[r] Vide Webſter's Connections of the Stomach with Life.

Let us, ſome days after inſerting the variolous matter, cut out the part, and no ſmall-pox will appear; no fever ſhall be excited in the ſyſtem; it is nothing now but a local complaint, unconnected with the habit at large. Experiments have been inſtituted for this end, and the event has correſponded with the doctrine of abſorption. It is difficult, however, to determine at what time exactly after innoculation this can effectually be done, becauſe abſorption takes place ſooner or later, from the varieties and peculiarities of temperament already hinted at; but it is probable it would ſucceed ſeveral days after inſertion, and at any time previous to the commencement of the eruptive fever. For had the abſorption been earlier, ſo would the commotion in the ſanguiferous ſyſtem; but ſince no change has taken place, till this time, I hold the diſeaſe to be local, and that the pus till now remained in the inoculated part.

We frequently find, in this diſeaſe, that the patient, a little before or about the ninth day, complains of a pain in the courſe of the lymphatics, and in the exilla of the inoculated arm; or if it be in the leg, in the courſe of the thigh, or in the groin, where lymphatics and lymphatic glands lie. In like manner, as abſorption happens here, ſo does it in the venereal diſeaſe; ſwelled lymphatics and glands may be diſcovered here alſo irritated by the poiſon they are conveying to the blood.

Though this conſtantly precedes the febrile ſymptoms in the one, or the peculiar ſymptoms that conſtitute the other relative diſeaſes, yet, were we to make our experiment *now*, it might not be deciſive; it might not prevent the progreſs of the malady: for enough of the poiſon having been carried beyond the reach of the knife to propagate the reſpective diſeaſe, the removal of what remains in the part where it was firſt inſerted, would not anſwer the end; our experiment here would fail; it would prove nothing. But ſhould this be done at an earlier time, when from the inflamed appearance of the little ſcar we might with reaſon conclude, that the diſeaſe, if not interrupted, would be communicated, we may reſt aſſured that our experiment will be deciſive.

If abſorption takes place in the variolous and venereal diſeaſes, if it takes place, likewiſe, from the infected poiſon of the rattle-ſnake, viper, and other venomous reptiles, which, from the experiments of Fontana, ſeem proved; and if it be allowed that the ſame takes place in ſome of the narcotic vegetable poiſons, as is proved by Profeſſor Monro[s] in the inſtance of opium; if the ſame happens, likewiſe, and it will be difficult poſitively to deny it, from the diſtilled water of the laureo-ceraſus, we ſhall find ſufficient analogical reaſon to conclude, that a ſimilar proceſs goes on in the caſe of rabid poiſon.

An argument is urged againſt abſorption in Hydrophobia, from our unſucceſsful attempts to trace the virus, either by pain in the courſe of the lymphatics, or ſwelling in the gland between the part where the poiſon was firſt inſerted, and the ſubclavian vein[t]. But an objection of the ſame nature might be urged both againſt variolous, and venereal poiſons. For lymphatics, and lymphatic glands are not obſerved, in every inſtance of theſe diſeaſes, to be either inflamed or painful in conveying the reſpective poiſons to the blood. It is certain, that numerous inſtances occur where nothing of the kind can be traced; and yet abſorption does take place, and the diſeaſe follows in conſequence. This difference appears to ariſe from the ſtate of the habit at the time, and the conſtitution in general, being more irritated and thrown into inflammation in ſome individuals, whereby the lymphatics, I mean the cutaneous, which the eye can trace, will exhibit marks of inflammation, though in a different habit the ſame cannot be ſeen. An incapability of tracing them may likewiſe proceed from a deviation in their common courſe. Should the lymphatic conveying the abſorbed virus ſink in among the muſcles, inſtead of purſuing a more ſuperficial paſſage, and then anaſtomoſe with others ſtill deeper, the matter will be carried to the blood, and no human eye can diſcern the ſmalleſt marks till its effects are diſcovered on the ſyſtem at large.

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[s] Vide Experiments on the Nervous Syſtem.

[t] Both Zwingerus and Scaramuccius, according to Morgagni, treating of the re-inflammation of the ſcar, affirm that it extends from the part (ſuppoſing the hand), upwards to the axilla; a proof that the poiſon has been traced to the gland. Vide Morgagni, epiſt. 8. § 21.

Every perſon engaged in the inoculation of the ſmall-pox muſt have frequent opportunities of obſerving, that the poiſon will find its way, imperceptibly, as it were, into the habit, without producing either pain or ſwelling in the arm or axilla: but an argument muſt not be drawn from thence, that an irritating poiſon does not produce inflammation, or that abſorption is not performed, when inflammatory marks with pain do not follow.

What has been ſaid of the ſmall-pox will apply to the venereal diſeaſe; I ſpeak chiefly of *lues*; for a buboe is an inflammation of the gland. But I know, from much experience in this diſeaſe, during ſome years practice in the army, that *buboes* do happen, where no pain, no external marks whatever of inflammation in the lymphatics leading from the penis and urethra to the gland in the groin, has been diſcovered either by the eye, or by the patient's ſenſations. I do not ſpeak here of ſympathetic buboe; it is the buboe from infection I have in view.

That abſorption has taken place and carried the poiſon hither we are certain, and it might be done with ſome degree even of inflammation, and yet eſcape our penetration, or through the medium of a veſſel deviating from the uſual courſe, and anaſtomoſing with others ſtill deeper ſeated. This laſt is a caſe I believe often occurring, a luſus naturæ, in the ſtructure of this part of our ſyſtem.

With reſpect to poiſons exciting diſeaſe; there are ſome of a far more irritating nature than others, that very ſpeedily communicate their effects, independent of any peculiarity of the ſyſtem. The poiſon of the rattle-ſnake, and of the viper we have quoted as of this ſort; yet to deny abſorption, even here, would be precipitate; nor muſt we infer from others, becauſe they lie dormant for a length of time, that when they are brought into action, that it is independent of the intervention of the lymphatics.

The rabid poiſon is long latent; it is longer than moſt others before it excites the diſeaſe named Hydrophobia; but we muſt not conclude that abſorption did not precede it; for it would be depriving an univerſal ſyſtem of veſſels, that exiſt in every animal, I believe, perfect, and imperfect, of the office univerſally allotted to them, and giving to irregular chance what belongs to a regular law in animal life.

Matter of any kind, when preſented to the mouths of the abſorbents, minute enough to enter, will be taken up. Matter from a cancer; from a putrid body. Surgeons have experienced this. Dr. Walſh periſhed[u] from a fever brought on by acrid matter abſorbed from a ſmall wound in diſſecting a putrid ſubject. He ſcratched his finger, and inſtead of cutting out the part, as a bye-ſtander wiſely adviſed, he waſhed it with warm ſoap and water only, and applied to the ſore ſome oil; but it was abſorbed, and a putrid fever was the conſequence, which proved fatal in three days.

Different ſtimulant ſubſtances of different irritating qualities, or in ſome manner differently fitted for entering their mouths, though both ſhould be inſerted into the ſame wound at the *ſame moment*, will be both abſorbed, but *not* at the *ſame time*; their different compoſitions and properties ſeem to give one a preference to the other: the lymphatics will lay hold of *this*, rejecting *that*.

From ſome late experiments of Mr. Abernethy we are led to conclude, that the removal of *oxygenous*, in preference to other kinds of air, is the effect of an active power in theſe veſſels. In the experiments alluded to, he found the *oxygenous* and *carbonic* gaſes readily *imbibed*; not ſo the *nitrous*, *hydrogenous*, and *nitrogenous*

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[u] January 1, 1788.

nitrogenous gaſes: it was with difficulty that the abſorbents admitted them. This is an uſeful phyſiological fact, and may hereafter lead to other important concluſions.

We have a proof of the elective power of the abſorbents in a caſe laid before a Society in London. Dr. J. Hunter making ſome obſervations on this ſubject, affirms, that in one of the patients, whoſe hiſtory was communicated to the Society, the *bite* immediately *inflamed* and *feſtered*, and on the *fifth day* an abſorption took place, as appeared by the ſwelling of a gland in the arm-pit, which was followed by a conſiderable degree of fever, that laſted ſome days; but *none* of the *ſymptoms* of *Hydrophobia* appeared till the uſual period, and after *ſigns* of a ſecond abſorption, when the diſeaſe proved fatal[w].

Several experiments have been inſtituted on living animals, which prove the abſorption of different kinds of airs at different periods when injected into the celular ſubſtance, forming an artificial emphyſema[x]. Dogs and rabbits

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[w] Vide Memoirs of a Society for the Improvement of Medical and Surgical Knowledge.

[x] Vide Beddoes' Conſiderations.

bits of different ſizes were ſubjected to theſe trials; in two of which, where nitrous air was uſed, the ſmell of the gas was evidently perceived when the lungs were inflated and left to collapſe; a proof incontrovertible, that the abſorbents contiguous to the celular texture had carried it to the blood, whence it was diffuſed through theſe parts.

If, as in theſe inſtances, the gaſes are abſorbed when introduced below the cutis, the ſame, we may conclude, will happen to any matter if ſmall enough to enter the mouths of lymphatics; though according to the matter it will be at different diſtances from its application; and this would appear to be in proportion to its irritating and ſtimulant powers. Shall we venture, then, to deny abſorption after the application of poiſon to an abraded ſurface, or more deeply wounded parts? Are the lymphatics ſuddenly rendered unfit for their office, and totally inert? This concluſion ſeems unwarrantable. Abſorption, Mr. Hunter[y] ſuppoſes to be performed by an active power in the mouths of the lymphatics, which may have different modes of action, according to the ſubſtance taken in by different animals; the mouths of which veſſels would vary accordingly.

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[y] Vide Hunter's Works.

This doctrine is, perhaps, corroborated by the inſtances of nitrous air on rabbits, and by the experiments of Mr. Abernethy[z], and may be applied as a farther proof of our poſition. We have ſeen that he found certain ſubſtances which they took up with *leſs avidity* than others preſented to them. I think it may be fairly inferred, that the poiſon of a rabid animal is alſo of a nature not to be *ſpeedily abſorbed*; but which like the virus of the ſmall-pox, and ſeveral other poiſons, will at length paſs through them into the habit.

Such is indeed the activity of this ſyſtem, that parts of the hardeſt bones have been taken up by them when found corroded, and the carious particles removed from the inſide of the ſkull, and not a veſtige left. This is a ſtill farther illuſtration that every thing preſented to their mouths, when fitted to their capacities, is taken up. Would it not be unphiloſophical to reaſon differently of the canine virus?

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[z] Vide Abernethy's Eſſays.

But it may be aſked, can any wound, whether of a poiſoned or ſimple kind, incarnate without this previous proceſs? None ſurely. When a wound is made, the edges become dead matter; the living principle continues its operation, and this dead matter muſt be caſt off, and is in reality removed by the abſorbents before the new and living parts can unite to form a cicatrix and reſtore the loſs. It is apparent therefore, that, be the nature of the wound what it may, whether ſimple, ulcerous, or poiſoned, abſorption precedes the cure. Yet abſorption of the poiſon, according to the foregoing ſuppoſition, is not always performed when a cuticle covers the external wound; and we have given an example where two different poiſons inſerted together, have, at different periods been carried to the general maſs, though by the incarnation of the ſore an abſorption of a third kind of matter (the dead ſloughs from its edges) muſt have gone on, otherwiſe an external cuticle could not have been formed.

It has been urged againſt abſorption, that when a wound by a rabid dog is inflicted, it heals as readily as an unpoiſoned ſore, or as a common cut from a ſharp inſtrument. And, ſince it exhibits no marks of inflammation, or riſes into a puſtule, the matter, according to theſe reaſoners, has neither reached the lymphatics nor the general ſyſtem. Strong objections may be taken to this argument. Although this really does happen in many inſtances of rabid wounds, it is rare if the cicatrix fails to re-inflame at a certain time after incarnation, exhibiting evident marks of abſorbed infection. The ſame thing, likewiſe, has been obſerved from bites by creatures that might only be termed *enraged*. A few days have perfectly cicatrized and covered the marks of the teeth with a fair cuticle, when a week or more afterwards a re-inflamed ſurface pointed out ſome latent miſchief.

A farmer's ſervant[a] employed in July 1796, with others of his fellows, in the removal of ſome ſtraw in the barn, and with expectation of finding rats, prepared himſelf with his comrades for deſtroying them. In performing this they uſed their hands only, often catching them alive. One fiercer than the reſt bit him on the third phalanx of one of his fingers with ſeverity, and was with ſome difficulty diſengaged. The wound healed, however, kindly in a ſhort time, without any apparent mark of inflammation; but about ten days after its incarnation, the cicatrix re-inflamed; the hand and arm ſwelled; and the man, through the pain, was thrown into conſiderable fever commencing in the common way with nauſea and ſickneſs. A tight knotty cord, as he expreſſed it, ſtretched towards the arm-pit, where ſeveral ſmall moveable tumours were felt painful to the touch. Alarmed at the ſtate of his arm, and tortured with pain, he applied to a Surgeon, and two months elapſed before his complete recovery, which was not brought about till ſuppuration, and a diſcharge of pus from the inflamed glands took place.

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[a] Servant to Mr. Francis, at Bacton, Suffolk. The anecdote I received from the family ſoon after it happened.

Here is a wound inflicted by an *enraged*, not *rabid* animal. It heals like a common ſore, and for ſome time remains apparently well. Irritation, however, from the animal's ſaliva (it is preſumed), at length gave riſe to a train of troubleſome ſymptoms. Its re-inflammation marked the beginning abſorption, and on its entering the blood, ſickneſs and fever were the conſequence; but had the poiſon been of a more deleterious quality, more violent ſymptoms might have uſhered in death. Is not this a parallel caſe, and illuſtrative of the progreſs of rabid poiſon? The virus of a rabid animal, however, takes a longer time to fit it for abſorption, or in other words, may poſſeſs ſome quality rendering it leſs ſtimulant, and leſs apt to enter theſe veſſels; therefore it may be inferred, that it is of a *weaker nature* than many other poiſons.

Although an external cuticle be formed in rabid wounds as readily, nearly, as in others, yet by the application of a bliſter over the re-inflamed ſcar, at the commencement of the malady, and the removal of the cuticle, a deep ulcer has been diſcovered beneath. Dr. Gray's patient is an example[b]. Here an abſorption of the matter of this ulcer muſt have been going on. It is dead matter, and extraneous with reſpect to the living and re-uniting proceſs; the abſorbents in contact muſt continue their office, and in removing it, we preſume, would imbibe at the ſame time the inſerted virus which produced this ichorous and unhealthy condition. The advantages that may reſult in the prevention of the diſeaſe from obſerving this ſtate, as well as the external re-inflammation of the ſcar, ſhall be reſerved for its proper place.

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[b] Vide Medical Commentaries.

Abſorption alſo has been denied on the grounds that an inflammatory fever is, for the moſt part, the conſequence of diſeaſes conveyed to the habit through the medium of the lymphatics. The ſmall-pox and meaſles have been brought as proofs of the objection. But no inference, in my opinion, can be fairly drawn from this ſource to diſprove abſorption of rabid virus. Symptomatic fevers are of great latitude, and are actuated by the ſtrength of the cauſe giving them birth. Whether the pulſe be ſtrong or weak, hard or ſoft, is no proof on either ſide: nor is the fever abſolutely neceſſary, I mean a fever giving evident marks to the patient by his feelings, and to others capable of remarking it, to introduce ſome poiſons into the maſs. *Lues venerea* ariſes from abſorption; yet the fever, when it is apparent, is of a ſlow and creeping kind, giving little diſturbance, as far as the pulſe indicates, and exhibits little or no marks of inflammation.

That the virus of a rabid animal affects the arterial ſyſtem is evident in every caſe after the appearances of the diſeaſe; but it does not follow that this fever, or change in the mode of circulation ſhould be of the inflammatory kind. It is the nature of variolæ, morbilli, and ſcarlatina to induce a change termed inflammatory; but it is not the nature, I believe, either of typhus carcerum, or of the ſlow nervous fever, or of pertuſſis to do this. Can we with any propriety deny abſorption of a *ſpecific materies morbi* becauſe we have no marks of an inflammatory ſtate of the body, indicated by a ſtrong, hard, and full pulſe; or becauſe when blood is drawn there are no marks of a buffy cruſt on its ſurface? We muſt notice, however, that from ſome of the hiſtories of the diſeaſe, marks of inflammation have been diſcoverable by the pulſe; for it was *hard* and *full*; yet I would draw no concluſion from this circumſtance, in favour of the preceding poſition. Diſeaſes of debility often ſhew this in a temporary manner; a paroxyſm in a convulſive diſorder often betrays ſuch a pulſe for a ſhort time; but this proves no more, than that now the ſyſtem is ſuffering under ſtrong irritation. The fit ends; the irritation ſoon ceaſes, or is leſſened; the pulſe ſubſides in proportion.

That this poiſon acts in a peculiar manner on the nervous ſyſtem is indiſputable---is evident. We need not now recite caſes to prove this point. Convulſions, dimneſs of ſight, dilatation of the pupil, paralyſis, numbneſs of limbs, together with almoſt the whole train of nervous ſymptoms, point out how much this ſyſtem of the animal frame is deranged. But is this a proof of want of abſorption? All that can be inferred is, that the peculiarity of the diſeaſe brings theſe along with it as conſtant attendants. Will it be denied that ſuch ſymptoms cannot be induced by an abſorbed matter?

Opium produces its effects both by abſorption, and by a local application to a part, where nerves are either laid bare, or are numerous, and thinly covered with their common defence. Profeſſor Monro has put this beyond diſpute. The peculiar ſymptoms produced when a greater quantity is ſwallowed than proper, are many of them evidently referable to the nerves. Dimneſs of ſight, muſcæ volitantes, and convulſions are the conſequence.

Hemlock and ſeveral other narcotic vegetable juices induce the ſame: riſus ſardonicus and contortions of the limbs, ſtarting of tendons, and ſuch like. I entertain not a doubt of their acting by abſorption. If the time after they have been taken till theſe ſymptoms appear be conſidered, I apprehend few will differ from me on this head.

In the year 1790, ſeveral German ſoldiers ate hemlock to dinner. They were quartered at Landguard-Fort in this neighbourhood at the time. They gathered it on the ſides of the adjacent banks in miſtake for ſome other herbs, which they had been accuſtomed to eat in their own country. Part they boiled in their ſoup, and part they ate in form of ſallad. It was ſeveral hours before its effects appeared; not till their dinner had ſufficient time to digeſt. At evening parade they exhibited a curious ſpectacle, giving ſtrong proofs of the activity of the poiſon; but all the ſymptoms with which they were affected, were more referable to the nervous ſyſtem than to inflammation. Some were rendered ſo blind as to be unable to guide themſelves; ſome ſtaggered as if intoxicated; and were reprimanded on that account, by their officers; ſome ſhewed curious geſticulations, both with legs and arms, in walking, and in attempting to perform the

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uſual manual exerciſe; ſome kept conſtantly grinning, as if affecting to laugh. One or two were miſſing, and on inquiry, they were found in a ſtate of inſenſibility at their quarters, in conſequence of the quantity they had eaten. All of them, however, recovered, but ſome with conſiderable difficulty. In a word, ſo numerous are the abſorbents, and ſo univerſal and uniform in their operation in taking up matters preſented to them, that I cannot ſee convincing reaſons, why, in the inſtance of Hydrophobia, they ſhould be denied the exerciſe of their common office. Nature acts by few and ſimple laws; let us not uſeleſſly multiply them.

Abſorption in Hydrophobia has been denied likewiſe, on the grounds that bitten perſons have undergone general diſeaſes and have recovered from them, yet the acceſſion of this diſeaſe was not prevented[c]. The concluſion they draw is, that the virus remains in the part, affecting the nerves in contact, ſlowly and gradually till it has induced a ſympathetic action over the whole nervous ſyſtem, appearing with the peculiar marks conſtituting the diſorder. This time, according to them, is altogether undetermined, and indefinite, and agrees with the variety obſervable in the commencement of the diſeaſe in different caſes. This ſeems to prove nothing; for it may be referred either to the weakneſs of the poiſon, or its peculiar nature, forbidding it to be abſorbed till after a period when ſome other diſeaſes have begun and run their natural courſe, and again diſappeared, according to the elective power in the abſorbents already proved.

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[c] Cocchi's aſſertion is doubtleſs alluded to here. "He affirms, that he knew *many*, who underwent the ſmall-pox ſubſequent to the reception of the bite of a mad dog, and died of its effects after their recovery from the former diſeaſe." Vide Van Swieten's Comment. aphor. 1137.

Other diſeaſes of the ſyſtem operate exactly in the ſame way. Let us exemplify it in the ſmall-pox, meaſles, and ſcarlet fever. After the poiſon of either of theſe is received, a catarrhal affection has been induced. It ran its courſe, or admitted of a cure natural or artificial, within the intervening ſpace, which one of theſe poiſons require before the reſpective diſeaſe appears. No prevention, however, takes place on account of the catarrh, perhaps even little or no retardation; the variolous or morbillous fever was in due time excited, with the peculiar diſeaſe in its preciſe form.

The rubbing in of mercury, ſay they, and the uſe of general remedies have not prevented Hydrophobia. True. The ſame exactly is the caſe in theſe other maladies mentioned. Mercury in no inſtance has been able to ſubdue the variolous poiſon after inſertion. When its period is complete, the abſorbents fail not to remove it from its local habitation, pouring it into the blood, whence it ſoon covers the ſurface with its ſpecific puſtules.

Hydrophobia, we have admitted, exerts its violence on the nerves. Every ſymptom obſervable in the diſorder ſerves as a proof[d]. It is for this reaſon we muſt contradict the illuſtrious Boerhaave, in his denominating it *ſummè inflammatorius*, as neither the diſſections nor other phœnomena authoriſe the aſſertion. It is true, there is a ſpecies of inflammation which diſſection detects, obſervable on the inner ſurface of the lower part of the æſophagus, and over the internal ſuperficies of the ſtomach. This may be ſeen in the form of linear dotted points of irregular ſhapes; ſometimes in cluſters, now ſmaller, now larger; ſometimes in ſmall abraſions with ragged edges. Theſe proceed towards the pylorus, beyond which they have ſeldom, if ever, been traced. Where this has not been detected, the ſtomach has appeared redder than uſual in health, proving an increaſed quantity of blood in the veſſels and its coats[e]. Yet this is far different from that kind of inflammation which has properly been called active. Here it is of the eryſepelatous kind, and is always accompanied with marked debility of the ſyſtem.

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[d] Vide Hiſtory of the Diſeaſe in the Human Subject.

Dr. Ferriar in a late inſpection has evidently proved the exiſtence of theſe abraſions; and from the ſhort diſtance between death and his examination, we may rely on theſe appearances as abſolutely belonging to the diſeaſe, and not to changes from putrefaction after the extinction of life[f].

Who can with propriety conſider a diſeaſe in the light of highly inflammatory, where there are faintings on the ſmalleſt motion, inability to bear an upright poſture, extreme ſenſibility to cold air, convulſive agitations, dilatation of the pupil, &c. &c? It is for this reaſon

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[e] Vide Webſter on Connection of Life with the Stomach.

[f] Zwingerus found the "inteſtines but eſpecially the ſtomach, to be diſtinguiſhed with red ſpots." Vide Morgagni, epiſt. 8. § 20. Others have found the ſame.

reaſon the uſe of the lancet is now prohibited, which before the inveſtigation of the nature of theſe ſymptoms, and while it was conſidered as inflammatory, was largely exerciſed. Not an inſtance, however, is to be found of a buffy cruſt on the ſurface of the blood.. There is, indeed, an example which, at firſt view, would ſeem contradictory to the idea of debility. This is an inſtance of a patient running with ſwiftneſs round Smithfield, a few minutes only before death; the diſtance is near a quarter of a mile[g], the exertion affording him only momentary relief. A ſecond inſtance may be found in Morgagni, where a boy in the paroxyſm dragged his father, who held him by the hand to reſtrain him, round the city of Bologna, a little before his death[h]. But this can no more be conſidered as a proof of exiſting ſtrength, in the common acceptation of the word, than a paroxyſm of high delirium in fever, followed immediately by a proportionate collapſe and death.

If it be admitted that there is a ſtrong ſimilitude between Hydrophobia and Tetanus, and ſome ſimilitude there certainly is, this muſt deſtroy every idea of an inflammatory diatheſis, as the eſſential mark of tetanus is debility; and that it never ariſes but from previous weakneſs, or from great irritation on the nervous ſyſtem, is indiſputably allowed.

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[g] Vide Tranſactions of a Society for the Improvement of Surgical and Medical Knowledge.

[h] Vide Epiſt. 8. § 22.

With reſpect to the analogy which has been maintained between the two diſeaſes, perhaps it may have been carried too far. This would appear, from the aſſertion, that in warm climates the occurrence of both is moſt frequent. Obſervation has not yet, I apprehend, fully eſtabliſhed this fact. Tetanus is indeed, endemial to warm climates; true and genuine tetanus ariſing from internal cauſes, expoſure to ſudden alternations of heat and cold, of damp evening dews, and piercing mid-day ſuns, of hard labour under the latter, and inactivity or the dangerous repoſe of ſleep under the former. Another caſe of tetanus muſt be allowed as ariſing accidentally in any climate; the caſe of excited irritation from extraneous bodies, from wounded tendons, &c. This laſt is rare when compared to the other. Warm climates and ſeaſons are not at all eſſential to the propagation of Hydrophobia, at leaſt the diſeaſe is far from being thus circumſcribed; its remote cauſes extend to climates of an oppoſite nature, to ſeaſons the moſt rigorous; or it appears alike in the more temperate and mild. Every man's experience is a proof of this. Who has not, in ſome part of his life, been diſturbed by the alarm of rabid dogs in the midſt of winter or depth of ſnow! But this is not the place to diſcuſs the queſtion of remote cauſe.

The diſeaſes differ alſo in another eſſential characteriſtic; Hydrophobia ariſes from infection; for the moſt part from the infection of a rabid animal. This is the moſt common; yet I do not aſſert, unequivocally, that it is the only caſe. It conſtitutes, however, a diſſimilitude between them tending greatly to weaken, though it may not totally deſtroy, the analogy. The ſymptoms, it is confeſſed, are very ſimilar; irritability and other marks of great nervous affection; but diſeaſes muſt not be claſſed by their ſymptoms only. This is a defect in noſology; their ſeats and cauſes, when known, ſhould not be omitted.

Other arguments have been advanced to eſtabliſh the analogy; the hiſtory, for inſtance, related by Morgagni, of a bite from an enraged, not rabid cat, inducing a tetanic diſorder reſembling almoſt perfectly genuine Hydrophobia. The ſame appearances have followed from mental impreſſions, ſuch as terror ſuddenly excited on obſerving a perſon ſuffering under the agonies of this malady; while they have ſerved at the ſame time, according to them, as ſufficient proofs, that without abſorption, in caſes even of rabid infection, Hydrophobia may commence and run its fatal courſe. The only inference, with ſafety, to be drawn from this analogy is, that tetanus, hyſteria, violent ſpaſms from ſudden mental impreſſions, and ſome other diſeaſes, of which Hydrophobia is one, are marked with difficult deglutition, and a few other ſymptoms in common. But this reſemblance holds no farther; it deſerts us in the inveſtigation of the cauſe; and it has hitherto deſerted us in the application of the cure.

We have ſeen an affection of the ſtomach and æſophagus in rabid Hydrophobia; we ſhall find a copious ſecretion of viſcid ſaliva, a conſtant concomitant, extremely troubleſome, and creating to the ſufferer one of his greateſt inconveniences, often ejecting it with a force, and with a rapidity aſtoniſhing to the by-ſtander. What have we in tetanus ſtrictly analogous to this? Can the trifling ſalival increaſe in triſmus bear compariſon, which ſeems to be little more than a dripping of the natural diſcharge from the corners of the mouth, in conſequence of the tongue being prevented, under this ſtate of rigidity of muſcles, and fixed poſition of the under jaw, from collecting it as uſual? With equal propriety might we pronounce cynanche tonſillaris (common quincy), ſtrictly allied, becauſe there is an increaſe of ſaliva from the inflammatory activity of the parts diſeaſed communicating with the ſalival glands. Yet who would call forth ſuch an analogy to eſtabliſh a ſimilitude with Hydrophobia? In a word, ſtriking differences may be found between theſe two diſeaſes ſufficient to weaken that intimate analogy which ſome authors wiſh to eſtabliſh, and at the ſame time to impreſs the mind with conviction, that ſomething more than local irritation takes place in Hydrophobia; that a ſpecific virus is introduced into the habit, and that nothing ſhort of this can ſo ſatisfactorily account for the ſcene we obſerve from the firſt appearance of the rabid action till death.

We muſt, however, coincide with Dr. Meaſe in concluding, "that the virus induces a general debility of the nerves, and deprives them of their healthy tone and cuſtomary energy which they had over the whole body;" but we would coincide on principles altogether different, namely, that it takes place *ſecondarily*, not *primarily*, or in other words, is produced through the medium of abſorption.

Might not hyſteria, or epilepſy, and tetanus, be conſidered as more ſtrictly allied than Hydrophobia? Theſe diſeaſes, in as far as convulſive motions form a ſimilitude, have much reſemblance; but examine their cauſes, examine alſo the appearances on diſſection, eſpecially in Hydrophobia; here they materially differ. Do we find in the two former diſorders marks of ventricular eroſions as a moſt common occurrence? Have we not reaſon, from the different diſſections made by different men, but eſpecially from Dr. Ferriar's, to believe that in Hydrophobia they are conſtant and eſſential to the malady? In the idea that the ſeat of the diſeaſe is in theſe parts, I am ſupported by Dr. Darwin's opinion, though it was my own years before I read his inſtructive works. He ſpeaks of an affection about the cardia, propagated by aſſociation from a more diſtant part; but omits the abraſions and local injuries of the ſtomach. This noble and neceſſary part of our machine, the ſtomach, being ſo diſordered, it is not ſurpriſing that convulſions ſhould follow. May we not attribute to its affections, and thoſe of the æſophagus near the cardia, the greater ſhare of that ropy diſcharge, already mentioned, and not ſolely conſider it as ariſing from the ſalival glands?

When tetanic affections ſucceed wounds, or ſplinters, or other extraneous bodies; or when they ariſe from internal cauſes, or alternations of heat and cold, &c. they generally appear at an early period after the injury. We cannot ſpeak thus of Hydrophobia; it is not ſo indetermined in its period (I muſt repeat the aſſertion) as authors have attempted to eſtabliſh. Who will affirm, after collating a ſufficient number of caſes[i], that the diſeaſe commences from one day after the bite to forty years and upwards? Credulity and imperfect obſervation have ſerved to multiply hiſtories of this kind, and the opinion is even at this day current with many. To moſt of the inſtances of early appearance, the name

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[i] Vide table of hydrophobic caſes.

Tetanus, not Hydrophobia, ought to be applied. When we read of Hydrophobia from the beak of a cock, the claw of a cat, the bite of ſome enraged creature, as of a rat, of an enraged horſe, or even of man, whether inflicted on his own perſon, ſuch as biting off the joint of a finger[k], from a paroxyſm of rage, or from diſappointment in love, or from fear and other ſtrong impreſſions of the mind, we may fairly conclude the affection was tetanus. On the other hand, when we peruſe caſes denominated hydrophobic, ariſing at the diſtance of forty years from their alledged cauſe, we need not heſitate to pronounce them either ſpontaneous from impreſſions of the mind, or from injuries recently received; or, if they were hydrophobic from rabies, a recent cauſe alſo, but forgotten or overlooked from the ſlightneſs of contact and injury at the time, doubtleſs gave them birth.

The diſtance from the cauſe in Hydrophobia to the appearance of the effects, is very far from indefinite; nor ought it to be conſidered in this light more than other ſpecific diſeaſes, that vary in the period of their commencement according to the nature of the poiſon, the conſtitution, &c. as we have inſtanced already. In the former, we conſider the weaker nature of the poiſon, or ſome other property it may poſſeſs, as a fact eſtabliſhed, requiring a conſiderable period to induce the complaint; in the other ſpecific poiſons, their ſtronger quality, or ſome other property peculiar alſo, rendering them more active, enables them in a ſhorter ſpace to do the ſame.

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[k] Vide Hiſt. et Mem. de la Societé Roy. de Medicine, Année 1783, part. 2.

There is another diſeaſe, which by ſome has of late been conſidered as infectious, and the infection likewiſe of a weak kind. In this light even Dr. Ruſh, views conſumption of the lungs. He is confirmed in this opinion by his obſervations. From theſe he infers, that the time of excitement is diſtant from the time of the reception of the poiſon, from two to three months; nay, in one caſe, the Doctor ſays, he obſerved the conſumptive contagion to lie inactive till near a year after it was received. Here is a latitude equally great with the hydrophobic poiſon; and if in one inſtance of infection this be admitted, where is the difficulty of admitting it in a ſecond? From the bite of the rattle-ſnake, to the bite of a rabid animal, we might form a ſcale, a ſcale, a regular gradation where the former begins, and the latter finiſhes it, of ſpecific animal poiſons having their effects excited after their reception all at different intermediate ſpaces, and all varying with reſpect to themſelves in the time of excitement, according to the habit on which their action is exerted.

In the conſumptive poiſon, the lungs are its ſpecific ſeat, the part on which it exerts itſelf; in the hydrophobic, the æſophagus and ſtomach ſeem to be the principal ſcene of its activity. If the Doctor admits abſorption in the former inſtance, he will not, we may preſume, refuſe it in the latter.

To account for the infrequency of Hydrophobia, compared to the number bitten, Dr. Percival has recourſe to an ingenious ſuppoſition, that " this poiſon ſeems to exert its energy *only* on *certain nerves* under *certain circumſtances*." When this condition is not preſent, the inſerted poiſon, conſequently, is inert. Is it not ſomewhat ſtrange that this condition ſhould be ſo often preſent in quadrupeds, that ſcarcely a dog, a cow, horſe, or hog bitten, eſcape; while, on the other hand, not more than one in about ſixteen, among the human ſpecies expoſed to the venom, become hydrophobic? Conſtitution, doubtleſs, and the peculiarities in the form of different ſpecies of animals, will reach this queſtion to a certain length; but the different coverings, the thickneſs of garment worn by man, cloſely ſurrounding his body, his upper and lower extremities, hands, face, and part of the neck excepted, afford him a protection nearly ſufficient for the explanation in a more obvious way.

Though the teeth may penetrate through the clothes, and a wound be given, yet they are wiped and cleaned, in ſome meaſure, from the adhering poiſon. This is not meant, however, to deny the eſcape from the diſeaſe in ſeveral inſtances where the naked ſurface has been expoſed to the bite; but to account for this, another ſuppoſition may be offered, not farther removed from probability, that the ſtate of the poiſon itſelf may be at one time more, and at another period of the dog's illneſs leſs virulent; juſt as we have formerly proved to be the caſe with reſpect to rattleſnake and viper; nay, perhaps, with the variolous poiſon likewiſe.

With reſpect to abſorption; the phœnomena of the approaching diſeaſe argues ſtrongly for its exiſtence. Marks of re-appearing inflammation round the cicatrix with pains from thence ſtretching towards the head, &c.

From the caſe of Race[l] ſigns of abſorption ſeem indicated. The ſame is indicated in Knipe's caſe[m]. This patient was bitten in the hand; he felt a pain ſtretching from the wound to the ſhoulder as harbingers of the approaching affection. We need only conſult the caſes annexed to be convinced, that theſe are far from ſolitary and inſulated examples of the ſame.

Pains of this nature round the wound, and ſtretching towards the head, heart, and body, afford ſtrong preſumption of abſorption, though neither inflammation nor tumefaction can be diſcovered in the axilla. One caſe is narrated, where along with theſe, the whole arm, from the wound upwards, became diſcoloured on the approach of the diſeaſe.

Little doubt can remain from what has been advanced, if all the phœnomena be carefully weighed, relative to abſorption; and as little reſpecting the *locality* of the poiſon where it was firſt inſerted, till the time of theſe appearances; or till the time peculiar to the virus, and neceſſary for this operation be complete.

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[l] Vide Appendix.

[m] Ibid.

plete. It may be ſuperfluous now to recal the reader's attention to the inſtance of double abſorption, as a farther corroboration of the different periods required by different poiſons to give them activity. But to remove all uncertainty of the intervening proceſs of abſorption, there are facts appearing directly to the point; and however credulity itſelf may ſtartle at ſeveral things advanced, not only by ancient, but even by modern writers on Hydrophobia, yet in theſe inſtances related without any view to hypotheſis, we cannot heſitate, I think, to give them credit.

The firſt of this nature which we ſhall adduce aroſe from contact only of rabid ſaliva, and without any injury done to the perſon[n]. According to the relater of this caſe, the diſeaſe took place on the eighth day following, and on the third day after this the patient died. This caſe is not the moſt favourable indeed in all its parts to eſtabliſh the point, but others have relied on it, and I ſhall therefore here take it in the ſame acceptation. The diſeaſe unqueſtionably aroſe much earlier, than we find in the generality of inſtances. From this we might be led to doubt whether it really ſprung from this ſource. Fear might operate on the patient's mind from ſo near a contact with a rabid animal, and tetanus and death ſucceed.

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[n] Vide Ephem. N. C. ann. 7. obſ. 121.

The ſecond I ſhall mention is likewiſe unfavourable to the doctrine attempted to be eſtabliſhed, which reſpects a diſtant period from inſertion. It is the caſe related by Cœlius Aurelianus[o]. Another doubt remains on the face of it, the doubt of inaccuracy, as he did not ſee the patient, but produces the hiſtory on the veracity and fidelity of a friend. He aſſerts the death of a female patient, *three days* only after the application of her lips to a ſeam in her garment, which ſhe was mending, and which a mad dog immediately before had torn in leaping on her as he paſſed, but without doing her any other injury. In laying the ſeam ſmooth, in this manner, ſhe received the moiſt ſaliva of the dog, on her lips and gums, the abſorption of which induced the malady. That it ſhould ariſe at ſo ſhort a period is with me the ſtumbling block: with ingenious Phyſicians who hold its production from one day upwards, to a very diſtant time, it will be none.

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[o] Vide De morb. acut. lib. 3. cap. 9.

none[p]. If this caſe be authentic, according to my poſition, the diſeaſe was tetanus, induced by fear from the near connection with the mad animal, and abſorption had but a doubtful ſhare in its production. If we allow abſorption, then we may ſuſpect the word *day* to have been inſerted by miſtake for *week*. Three weeks is a period at which true rabid caſes have appeared. I have brought theſe two caſes forward, though leſs favourable, in its full latitude, to the opinion here advanced, becauſe they are both ſaid to have happened without abraſion of cuticle; and conſequently, it is to be preſumed, through the abſorption of the virus by which it was beſmeared.

The third example is more ſatisfactory; in the diſtance of excitement from the application of the cauſe, it accords more with many well aſcertained inſtances; for Hydrophobia did not take place till *(poſt multos dies)*, many days had intervened. The author of this relation is Johan. Mathæus. He affirms that Hydrophobia aroſe only from the introduction of the hand into the mouth of a mad dog, without the ſlighteſt wound being received. The patient's name was Johan. Coqueranus[q].

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[p] The canine virus "has been known to infect in all the intermediate periods, between the *firſt day* of a bite, and nineteen months afterwards." Vide Meaſe's Eſſay on the Bite of a Mad Dog, page 68.

The fourth authority we ſhall cite is that of Matthiolus. He adduces two inſtances, from his own obſervations, where the diſeaſe aroſe from the contact with ſaliva, and alſo without the infliction of a wound; and he ſeems offended with the incredulity of thoſe who doubt the poſſibility of ſuch a fact.

The fifth is that of Hildanus. In a letter to his friend Dr. Abel Roſcius of Lauſanne, he relates a ſimilar example, and pledges his veracity for its truth. The ſubject of the caſe was a woman whoſe gown was torn by a mad dog (ſhe did not at that time know the dog was rabid) but from which ſhe received no injury. In ſewing up the rent ſhe bit off the thread, the part being as yet wet with the dog's ſaliva, and in three months after the diſeaſe ſeized her and ſhe died[r].

A ſixth authority is from Cardan. The inſtance he relates of Hydrophobia by contact merely with ſaliva, is that of a perſon who requeſted to kiſs his mad dog before it was drowned.

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[q] Vide Joh. Mathæi Conſul. N° 82.

[r] Vide cent. 1. obſ. 86.

drowned. He received no bite, yet afterwards fell a victum to the diſeaſe. Cardan was called in conſultation; he predicted his death (no very difficult taſk), which took place on the following day.

The ſeventh is Dr. Bardſley. He adduces an inſtance on the authority of Dr. Percival, equally to the point. A man living at Worral in Cheſhire, having fell aſleep on the ground, and while he was in this ſituation, a mad dog accidentally came paſt, licked him about the mouth, then ran away without doing him further injury. He was ſeized with the diſeaſe about the uſual time, and died in conſequence.

The eighth authority is from the Swediſh tranſactions[s]. The inſtance alluded to, is that of a lad who had been in the habit of ſleeping with a lap dog. This creature had contracted the diſeaſe, and was then under its influence, though undiſcovered both by the family and the boy. It died rabid the following day from the diſcovery. As the diſeaſe continues in this animal, from its acceſſion to its termination, in general about ſeven days, we may conclude, that the boy muſt have received the infection from his dangerous bed-mate, ſeveral days before its death. The dog's death happened on the 12th of June; the firſt intimation of Hydrophobia in the boy appeared on the 24th, but it was ſix days from this till death. The horror of liquids manifeſted itſelf only twenty-four hours before. No bite had been received from the animal, but, as had been his cuſtom, he carried and handled it. There can be little doubt, likewiſe, of his having kiſſed it, and through this channel received the virus; for the lad "complained to other people of its *ſtinking* breath."

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[s] Vide ann. 1777.

The ninth we quote from M. de la Pryme. It is preciſely to the ſame effect; there was no bite here. The fingers only were introduced into a whelp's mouth, for the purpoſe of examining its tongue, and diſcovering the cauſe of its not ſwallowing readily. It died rabid ſoon after, as had the mother and the reſt of her litter juſt before, and as afterwards did the unhappy youth alluded to[t].

The tenth, which ſhall cloſe this catalogue, is that which I have related formerly[u]. This inſtance,

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[t] Vide Philoſophical Tranſactions, N° 277.

[u] Vide Remarks on Hydrophobia, &c. 1785.

inſtance, indeed, labours under the ſame ſuſpicion with that of Cœlius Aurelianus, wants my occular teſtimony, and like his too, is introduced on the veracity of a friend, but who inſiſted on its being fact. His death ſince prevents me from bringing him forward in his own name. He was a man of letters, however, and guarded in his aſſertions; in giving full confidence to his relation, no ſuſpicion whatever need be entertained, I may venture to affirm, of miſrepreſentation. Eaſy credulity in a man of letters, and a philoſopher, would, indeed, be a blemiſh. This inſtance has likewiſe a great ſimilarity both to that given by Cœlius Aurelianus and Hildanus, and by ſome might even be miſtaken for a tranſcript of the one, or the other. Notwithſtanding this I am perſuaded of the fact.

A young woman had her apron torn, and ſlavered by a mad dog leaping on her and attempting to bite. Fortunately ſhe received no other injury from him, by the timely aſſiſtance offered, and by the looſe part of her cloathing which he laid hold of. But imprudently, and without proper reflection, ſhe began to mend the rent in her apron before the part was either waſhed or well dried; and as imprudently, or through habit, inſtead of cutting the thread with ſciſſars, bit it off with her teeth. Lo, what followed! In a few weeks ſhe was ſeized with Hydrophobia, which proved fatal.

In every inſtance here collected, no wound was given; no injury received; the ſaliva alone, or more properly, part of that diſcharge iſſuing from the fauces, æſophagus, &c. together with the breath, in a few of the examples, beſmeared ſome external part only of the cuticle or thinner epithelion. The fingers and hands, the lips and gums, where the pores are more than uſually patulent, had the virus applied to them. That the abſorbents laid hold of it and carried it from thence, juſt as in the caſes of air thrown under the ſkin into the cellular texture, and the gaſes applied externally by Abernethy, cannot, I apprehend, admit of a doubt, and would ſeem to eſtabliſh incontrovertibly the opinion of abſorption.

Leaving the opinions of *local irritation*, and *abſorption*, to be further diſcuſſed by ſuch pathologiſts, as may conceive the arguments here adduced inconcluſive on either ſide, we ſhall proceed, without further delay, to conſider the queſtion formerly propoſed[w], viz.

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[w] Vide page 32.

In what manner is the practitioner to conduct himſelf, in order to obviate the impending danger, from rabid virus, either inſerted in a wound by the animal's tuſks, or beſmeared over ſome naked part of the body, thinly and delicately covered with cuticle? Whatever may be the iſſue of the opinions reſpecting *primary irritation*, and *abſorption*, according to the doctrine attempted here to be eſtabliſhed, the method proper to be purſued will be preciſely the ſame. We enter, therefore, on it with more confidence, and without much apprehenſion of contradiction, as to general principles, though the particular mode of execution may admit of ſome diſpute. But firſt it may be requiſite to examine ſomewhat more intimately into the aſſertions of reſpectable writers, relative to the early commencement of the diſeaſe, which, from the following view, it will be evident, can ſcarcely be admitted as facts.

THE OPINION TO BE REJECTED OF ITS COMMENCEMENT FROM THE FIRST HOUR TILL YEARS AFTER THE BITE.

THIS opinion held by ſome eminent characters, both ancient and modern[a], being diſſonant to the laws of other poiſons, cannot, conſiſtent with the view I have attempted to give, on the authority of many caſes, be received here as a fact. That diſeaſes have commenced ſoon after the infliction of a wound from animals of various claſſes, both rabid and enraged, cannot be conteſted. Such inſtances appear to be related with fidelity as the facts preſented, or were given on good authority from the obſervations of others. Theſe diſeaſes however, ſeem clearly to have their origin from a different ſource; they aroſe from tetanus, the conſequence of irritation.

When I read of hydrophobic caſes ſpringing from the bites of cocks and other domeſtic fowls, of horſes, cows, apes, ſwine, &c. as before mentioned, if they are to be credited, it is to this ſpecies of diſeaſe we are to refer them. Though affections of this nature commence ſoon after the application of their cauſe, yet neither my own, nor the experience of thoſe with whom I have had medical communication, can produce an inſtance of an attack ſo early as the firſt hour. Books, however, furniſh ſuch aſſertions; and they are applied alſo to Hydrophobia, which, if my conjectures be right, are ſtill more improbable. Tetanic affections ſeldom ariſe ſooner than twenty-four or thirty hours after the application of their exiſting cauſes. They have appeared after three days, they have been protracted to ſix, but I know not whether as a general law they have often been protracted beyond ten days, or commenced earlier after the applied cauſe, than ſix hours. With reſpect to the three following inſtances; the firſt appeared a *few days* after the application of the cauſe; the ſecond at the diſtance of ſeven, being occaſioned by the extraction of a tooth, and even this not till after expoſure to cold; and the third from a puncture with a ruſty nail in the foot, on the ninth day. Allowing the puncture to be the cauſe in this example, it it is among the lateſt perhaps of appearance; but there is ſufficient grounds for its excitement, in the very ſevere labour the patient ſuſtained in the exerciſe of his buſineſs on the timber raft where he was taken ill, which, if granted, will limit it to the preceding day only. The exceſſive heat, the fatigue and labor, his wet clothes, joined to the dampneſs of the night air on the water after copious perſpiration, are of themſelves adequate.

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[a] "For ſome people" ſays Boerhaave, "are *immediately* ſeized with the ſymptoms of this diſeaſe; others not till twenty years after, &c." Vide aphor. 1137.

Dr. Gloſter's patient was ſeized *twenty-four hours* from the time of ſleeping on the damp ground; this was after great fatigue and heat.

The maid ſervant attended by Dr. Ruſh became affected *next day* from ſleeping on a damp brick pavement, after great heat of the weather[b].

Leſlie, another patient of Dr. Ruſh, who ran a nail into his foot, was attacked *next day* with tetanic ſpaſms[c].

A patient under my care having uſed a ſhower bath about ſix in the morning (July 1793), was attacked about four in the *afternoon* of the ſame day with excruciating tetanic ſpaſms in the ſace, diſtorting the eye-balls and countenance.

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[b] Vide American Tranſactions, vol. 1. page 379.

[c] Ibid. vol. 2. page 225.

A patient in this place with a compound fracture of the limb, on the *third day* after the accident, was ſeized with tetanus which proved fatal. Beſides theſe, the following caſes are additional proofs.

Firſt, locked jaw from a wound. In this caſe the diſeaſe began to appear on the day after the granulations in the part loſt their florid colour and became ſanious. I date the application of the irritating cauſe from this time[d].

Second, another caſe of triſmus. Here it came on in a *few days* after the application of the irritating cauſe[e].

Third, a negroe boy was ſun-ſtruck. *Very ſoon* after, on the ſame day, he was ſeized with locked jaw, and other tetanic ſpaſms[f].

Fourth, a ſecond negroe boy received a ſevere beating about the temples with a ſtick; and in *a few hours* after ſymptoms of triſmus appeared[g].

Fifth, a third negroe after ſevere labour in hot weather was ſeized with the ſame diſeaſe *very ſuddenly*[h].

Sixth, a fourth negroe having received a wound in the ſole of his foot was attacked with tetanus and locked jaw on the *third day* after.[i]

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[d] Vide London Medical Eſſays, vol. 3.

[e] Ibid. vol. 4. [f] Ibid. vol. 6. [g] Ibid. [h] Ibid.

Seventh, a fifth negro (a female) from ſleeping in the open air, expoſed to the cold, was ſeized *ſoon* after with the ſame diſorder. By what follows in the hiſtory of her caſe, it is evident ſhe became affected in the courſe of the ſucceeding day.[k]

Eighth, in another caſe the time from the application of the cauſe to the commencment of the diſeaſe is not ſo diſtinctly marked. It aroſe from lodging in a bad hut, in a damp and low ſituation during foggy weather: but it may be eaſily conceived, that it was not long after expoſure to ſo powerful an agent in the production of this malady.[l]

Ninth, it was the *fourth day* from the bite of the enraged cat mentioned by Morgagni, when tetanus (for it was not Hydrophobia) commenced.

Tetanic affections ariſing from ſuch cauſes, keep no regular time; yet they are never at any great diſtance from the application of their cauſe.

In ſome caſes which authors term hydrophobic, but which I would refer to this head, the patient has been ſeized about the *third day.* Cœlius Aurelianus gives one commencing at the third day.[m]

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[i] Vid. Lond. Med. Eſſays, vol. 6. [k] Ibid. [l] Ibid.

Now, from the authentic hiſtories of Hydrophobia really ariſing from rabid infection, I believe not a ſingle inſtance can be produced *ſo ſoon*, much leſs *previous* to the tenth day. From theſe conſiderations, and from a review of the caſes inſtanced in the following table, not to mention many others that could be adduced, I muſt abſolutely and totally reject the idea of Hydrophobia from rabid virus taking place, not only from *one hour*, but alſo "in all the intermediate periods, from one day after the bite, till eighteen months;"[n] or in other words, I contend, that it ſeldom, if ever, commences before the nineteenth day, or after the eighteenth month.

In all my reſearches, I can find but a ſmall comparative number commencing earlier than the eighteenth day. There are indeed a few caſes given as authentic of an earlier appearance; but I would conſider them rather as deviations from a general law, and exceptions ſerving only to eſtabliſh more firmly a general rule. Theſe are George Cobb, a boy, who we are informed took the diſeaſe on the eleventh day;[o] another boy, at Colne, in Eſſex, who became affected on the twelfth day from the bite; and a caſe of which an account is given in the Memoirs of the Royal Medical Society at Paris for 1783, part 2.

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[m] It is that already quoted as an example of abſorption without a wound, but which, from this circumſtance, was given as a ſomewhat doubtful caſe, from ſo great a deviation in reſpect to the general law of Hydrophobia. If there be no error in the date, I apply it as an inſtance in this and reject it as an example of the other.

[n] Vid. Meaſe on the Bite of a Mad Dog, 1783.

From the 18th to the 30th day, the numbers truly are comparatively few; for out of 131, only 17 took the diſeaſe ſooner than the 30th day. The number of the next claſs is great, conſiſting of no fewer than 63 from the 30th to the 59th day incluſive.[p] The next claſs diminiſhes; for we have only 23 from 2 to 3 months incluſive; nine from 3 to 4 months incluſive,[q] two of 5 months, one 5 months and 11 days, one 6 months, one 7 months, two of 8 months, one between 8 and 9 months, two of 9 months, one of 11 months, one of 14 months, two of 18 months, and one of 19 months,

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[o] Vid. Med. Facts, vol. 3.

[p] No. 19 and 33, marked at *ſeveral weeks*, included here.

[q] One of theſe, though claſſed here, uncertain as to time, Morgagni, relating the circumſtance, only ſays "*ſome* months."

months, the longeſt to which any credit can be given.

It is apparent, that from the firſt month to the third incluſive after the bite, the diſeaſe ſhows itſelf in a decided majority; viz. in no leſs than 87 caſes out of the whole. The next 3 months comprehend only 11 inſtances; the ſucceeding 6 months completing the year, only ſeven; and in the next and laſt period, including the 19th month, there are only four inſtances.

If we have conſidered theſe under 18 days as irregular and extraordinary, we may, in like manner, view thoſe four, in the laſt diviſion, as of the ſame nature. Nor do they diſturb the general law proper to this diſeaſe more than caſes of inoculated ſmall-pox, commencing occaſionally on the 7th day, tend to diſturb the general law of that malady; yet extending, as is ſometimes found, to the 10th, or even 14th;[r] though at a medium the 9th may be conſidered as the time of febrile acceſſion.[s] A ſimilar deviation is found in other complaints; this has been noticed already; and in the plague itſelf, the commencement varies from ſix hours to four days, though the general time of attack lies between. But let the reader peruſe the following table, and draw his own concluſions.

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[r] An inſtance of this has already been given.

[s] Authors have placed it at the 8th day; but in more than 1500 inſtances, under my own care, the majority fell on the 9th.

TABLE.

SEX, AGE, AND DISTANCE FROM BITE.*

MALE ADULTS.

No.	Name, &c.	Age.	Distance.
1.	------- Bean	69	26 days.
2.	------- Bellamy[a]	40	4 months.
3.	John Slight	23	60 days.
4.	A patient	36	5 weeks.
5.	------- Race[b]	40	6 weeks.
6.	Francis Tweed[c]	55	20 days.
7.	A farmer	25	9 months.
8.	James Corton[d]	-	6 weeks.
9.	A patient	45	10 weeks.
10.	Thomas Hogg[e]	33	27 days.
11.	Morgagni's patient[f]	60	3 months.
12.	Ditto (a monk)	-	2 months.

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* Thoſe caſes to which there are no references, may be found chiefly in different periodical publications, in the hands of every Engliſh medical reader.

[a] Fothergill's Works. [b] Vid. App. [c] Ibid.
[d] Philoſ. Tranſ. [e] Med. Comment. D. 2, vol. 10.
[f] Vid. Morgagni, Epiſt. 8.

No.	Name, &c.	Age.	Distance.
13.	John Edwards[g]	40	8 months.
14.	Blaiſe's 1ſt patient[h]		1 month.
15.	Ditto ſecond		6 weeks.
16.	Ditto third		74 days.
17.	A gardener		4 months.
18.	Howman's patient[i]		6 weeks.
19.	Pey Dumenia		*ſeveral* wks.
20.	Gardener's ſervant		4 months.
21.	Mead's 2nd patient	45	66 days.
22.	Munckley's patient[k]	36	39 days.
23.	Vaughan's 2nd patient	25	9 months.
24.	Hildanus's 1ſt patient[l]		3 months.
25.	Ditto ſecond		3 months.
26.	Ditto third		7 months.
27.	Hammond's patient		6 weeks.
28.	William Bland[m]		4 months.
29.	A patient[n]		4 months.
30.	William Knipe[o]		11 months.

[g] Gentleman's Mag.

[h] Vid. Mem. de la Soc. Roy. de Med. ann. 1783, p. 53.

[i] Philoſ. Tranſ. Lond.

[k] Med. Tranſ.

[l] Uncertain of age and ſex in theſe three, the work not being at hand.

[m] James on Canine Madneſs.

[n] Vid. Mem. de la Soc. &c. This is the only one of nine bitten by the ſame mad wolf, who took the diſeaſe.

[o] Med. Comment.

No.	Name, &c.	Age.	Distance.
31.	Choiſel's patient[p]		33 days.
32.	Mr. Dawſan		6 weeks.
33.	------ Criques		*ſeveral* wks.
34.	A patient[q]		*ſome months.*
35.	Ditto[r]		1 month.
36.	Dundas's patient[s]		18 months.
37.	A gardener[t]		55 days.
38.	A patient[u]		52 days.
39.	------ Boyer[v]	25	74 days.
40.	A patient[w]		4 months.
41.	Ditto[x]		8 or 9 months
42.	Ditto		5 months.
43.	Ditto[y]		5 mon. 11 days.
44.	John Johnſton[z]		3 months.

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[p] James on Canine Madneſs.

[q] This patient was ſuddenly plunged into water, and held there ſome time. He died next day. Vid. Morgagni, Epiſt. 8. § 22.

[r] Plunged alſo into water, and died immediately on being taken out. Ibid. § 25.

[s] They ſuppoſed the dog mad: he was ſhot inſtantly. To me the diſeaſe appears the product of terror from apprehenſion of this malady, and agitation of the mind ariſing from the fear of impriſonment for debt.

[t] Mr. Sabatier's patient.

[u] Ditto.

[v] Vid. Lond. Med. Journ. vol. 5, App.

[w] Mentioned by Dr. Houlſton.

[x] Bitten by a cat. Wieſel Obſ. Rar. Cent. 1. No. 100. p. 400.

[y] Van Swieten Comment.

[z] Med. Facts, vol. 1, p. 1.

No.	Name, &c,	Age.	Distance.
45.	Jeremiah Groves[a]	-	96 days.
46.	A patient[b]	35	1 month.
47.	Ditto[c]	-	1 month.
48.	Ditto[d]	30	1 month.
49.	Ditto[e]	46	3 months.
50.	Louis Michaut[f]	-	3 months.
51.	Sieur Gravan[g]	72	38 days.
52.	Jean Arbelot[h]	28	68 days.
53.	A patient[i]	-	58 days.
54.	Pierre Delplain[k]	-	30 days.
55.	------ Boſquet[l]	-	53 days.
56.	Jacques Maſſelon[m]	-	25 days.
57.	A patient	60	3 months.
58	Ditto	-	38 days.
59.	Ditto	-	44 days.
60.	A man cook[n]	30	40 days.
61.	A patient, an advocate[o]	32	6 months.
62.	Ditto, an ideot[p]	-	21 days.
63.	Ditto, a maſon[q]	22	8 months.

[a] Dr. Maclean's patient, Sudbury.

[b] Bitten by a cat. Dr. White's 1ſt patient, St. Edmund's Bury.

[c] A middle aged man. Dr. White 2nd patient.

[d] Dr. White's 4th patient.

[e] Vid. Mem. de la Soc. Roy. de Med. ann. 1783, page 46.

[f] Ibid. page 110.

[g] Ibid. p. 175.

[h] Ibid. p. 31.

[i] Ibid. p. 52.

[k] Ibid. p. 117.

[l] Ibid.

[m] Ibid. p. 122.

[n] Ibid. p. 222.

[o] Ibid. p. 234.

[p] Ibid. p. 289.

[q] Ibid. p. 290.

No.	Name, &c.	Age.	Distance.
64.	A patient[r]	-	18 months.
65.	G. Pollock	45	3 months.

Males under Twenty-one Years of Age.

No.	Name, &c.	Age.	Distance.
66.	Mead's firſt patient	9	32 days.
67.	Ditto third	18	3 months.
68.	James Paton[s]	14	12 weeks.
69.	John Brown[t]	13	4 months.
70.	Blaiſe's 4th patient	-	6 weeks.
71.	A ſtudent of phyſic[u]	17	1 month.
72.	Abraham Palmer[v]	14	38 days.
73.	C. Bullock	4	37 days.
74.	Samuel Smith	18	45 days.
75.	Dr. Gray's patient[w]	12	24 days.
76.	Vaughan's 1ſt patient	14	1 month.
77.	Ditto third	8	ditto.
78.	Maſter Rowley[x]	11	36 days.
79.	Indian boy	14	30 days.
80.	A patient[y]	-	18 days.
81.	Berkenhout's patient	-	6 weeks.

[r] Vid. Van Swieten Comment. on Boer. Aphor. 1137.

[s] Med. Comment. vol. 3, p. 290.

[t] Lond. Med. Obſ. vol. 3, p. 356.

[u] Med. Eſſay, Edinb. vol. 5, part 2, p. 590.

[v] Lond. Med. Comm. [w] Med. Comm. [x] Vid. App.

[y] Swediſh Tranſ. for 1777.

No.	Name, &c.	Age.	Distance.
82.	Nourſe's ditto[z]		19 months.
83.	George Cobb[a]		11 days.
84	------ Jones	7	1 month.
85.	A patient[b]	12	12 days.
86.	Ditto[c]	12	40 days.
87.	Ditto[d]		5 months.
88.	William Bickerſtaffe	14	25 days.
89.	------ Macy	5	20 days.
90.	A child[e]		1 month.
91.	Ditto[f]		ditto.
92.	Ditto[g]		ditto.
93.	A patient[h]	14	26 days.
94.	Elzeard Roche[i]	15	46 days.
95.	A patient[k]	12	40 days.

[z] Philoſ. Tranſ. This is the longeſt on record.

[a] Weeks's patient. Med. Facts, vol. 3.

[b] Mr. Rainbird's, at Colne.

[c] Morgagni, Epiſt. 8 § 22.

[d] Ibid.

[e] Lond. Med. Journ. vol. 10, p. 293.

[f] Ibid.

[g] Ibid. Theſe patients were three of eleven perſons bitten by the ſame dog, eight of whom eſcaped, and their preſervation is ſaid to be owing to the exhibition of the Tanjore pill.

[h] Dr. White's, of St. Edmund's Bury, third patient.

[i] Vid. Mem. de la Soc. Roy. de Med. ann. 1783. part 2, page 32.

[k] Ibid. page 55. This is not the exact time; for it cannot be found out to a day. The author only ſays, "From fifteen to twenty people were bitten by a mad wolf, about the ſuburbs of the city of Thiers, in the month of Feb. 1764; on the 20th of March he arrived there from Paris, and hear-

No.	Name, &c.	Age.	Distance.
96.	Gervais Briquet[l]	12	58 days.
97.	Jean Petit[m]	5	52 days.
98.	—— Caſtinel[n]	6	60 days.
99.	A maſon[o]	16	52 days.
100.	A patient[p]	5	14 months.
101.	Ditto[q]	14	1 month.
102.	Ditto	8	ditto.
103.	Ditto	3	25 days.

FEMALE ADULTS.

No.	Name, &c.	Age.	Distance.
104.	Mary Strong	43	2 months.
105.	A patient at Edinburgh[r]	74	72 days.
106.	A French woman[s]		3 months.
107.	Maiden lady at Modena[t]		50 days.
108.	A maid ſervant[u]		6 weeks.

ing of the accident, was deſirous of waiting the event, as he had never ſeen a caſe of Hydrophobia." About ſeven or eight days, he tells us, after his arrival, this patient took the diſeaſe, and died about 24 hours after difficult deglutition commenced. In two days more, the female mentioned at No. 110, took the diſeaſe, and died in thirty hours. If we ſuppoſe the accident to have happened about the middle of February, and to this add 28 days of the month of March, the time this patient was ill, it gives 42 days. In our table we have marked it at 40, which cannot be far from the truth.

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[l] Vid. Mem. de la Soc. &c. page 155.
[m] Ibid. p. 29.
[n] Ibid. p. 225.
[o] Ibid. p. 242.
[p] Ibid. p. 282.
[q] Ibid. p. 298.
[r] Med. Com. D. 2, vol. 7, p. 546.
[s] Vid. App.
[t] Morgagni, Epiſt. 8.
[u] Bitten by a cat.

No.	Name. &c.	Age.	Distance.
109.	M. A. Proghammerin	26	60 days.
110.	A patient[v]	26	40 days.
111.	Catherine Champion[w]	55	30 days.
112.	The widow Perronet[x]	-	52 days.
113.	Edmée Thibaudat[y]	-	57 days.
114.	Frances Etheveniot[z]	37	44 days.

Females under Twenty-one Years of Age.

115.	------ Niece[a]	7	19 days.
116.	------ Chriſty[b]	11	6 weeks.
117.	A patient	3	22 days.
118.	Ditto[c]	8	40 days.
119.	Ditto[d]	12	55 days.
120.	Ditto[e]	9	3 weeks.
121.	Ditto[f]	10	4 or 5 wks.

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[v] Vid. Mem. de la Soc. &c. page 55. [w] Ibid. p. 139.

[x] Vid. Mem. de la Soc. Roy. de Med. p. 117.

[y] Ibid. [z] Ibid. p. 30. by a cat.

[a] Med. Tranſ. Coll. Phy. Philadelp. [b] Vid. App.

[c] This happened at Glaſgow, in the year 1792. Vid. Med. Comment. D. 2, vol. 7, p. 543.

[d] Vid. Lond. Med. Journ. vol. 5, App.

[e] Mr. Godfrey's, Coggeſhall. [f] Ditto.

Neither Age nor Sex are mentioned of the following ten Patients who died of the Diſeaſe, out of Seventeen bitten by the ſame mad Wolf.[g]

1.	-	15 days.	6.	-	33 days.
2.	-	18 days.	7.	-	35 days.
3.	-	19 days.	8.	-	44 days.
4.	-	24 days.	9.	-	52 days.
5.	-	30 days.	10.	-	68 days.[h]

From a careful review of theſe examples, the reader is enabled to eſtimate the value of many looſe obſervations, made not only by the ancients, but by ſeveral of the moderns on Hydrophobia. The ancients, in remarking on the diſtance from the bite to the commencement, were tolerably accurate, as are thoſe moderns who have followed them. The period which Cœlius Aurelanus, Galen, Paulus, and Actuarius, with Boerhaave and Van Swieten who followed their opinion, if not altogether exact, is but little ſhort of the average when they ſtated it at forty days.

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[g] Vid. Mem. de la Soc. &c. page 208.

[h] I find from my reſearches into authors, the fatality from wolves to be much greater than that from dogs. In the preſent inſtance conſiderably more than half died hydrophobic. Is the famiſhed condition of this animal connected with the frequency of his becoming hydrophobic? Is hunger in animals a frequent exciting cauſe? Is the cottage cur (oftener irregularly fed) more liable to Hydrophobia than the lady's lap dog?

As the diſtance here varies from the 15th to the 68th day, I regret the more this omiſſion; I regret likewiſe, that the caſes are not detailed at full length; that the variety of ſymptoms, and other concomitant circumſtances, might be compared. Where ſo many died from the ſame animal ſomething might be learned farther than we yet know, reſpecting the virulence of the infection; whether it leſſens, as happens to the viper, in its ſtrength, proportioned to the number wounded; whether alſo the young were attacked ſooner than more advanced; whether, in females, it followed the ſame law; and laſtly, whether from the wounds in the face and parts adjacent, the diſeaſe appear earlier than if more diſtant from the heart, as ſome have alledged.

Theſe caſes will enable us alſo to diſcover, whether we are to rely on an obſervation of a modern writer, affirming that women and children are ſooner ſeized than male adults. We do not find ſex either retarding or accelerating the commencement of other ſpecific diſeaſes; neither has age any influence. The ſmall-pox, the meaſles, or ſcarlatina, appear at their reſpective times, regardleſs of ſex or age, due allowance being made for conſtitution.

Of eleven female hydrophobic adults, the youngeſt of whom is 26, none are ſeized with the complaint under a month. One takes the diſeaſe at a month, ſix remain free till nearly two months; two are ſeized at the completion of the ſecond month; one between the ſecond and third month; and the laſt not till the end of the third month. This diſproves the obſervation:

vation: it is diſproved ſtill farther by the female hydrophobic children; for out of ſeven, the eldeſt of whom is only 12, three eſcape the diſeaſe till between 40 days and two months. In the claſs of boys its incongruity with nature is ſtill more apparent; for no fewer than 22 out of 38 remain in health for one complete month; and three from two to three months. Nay, it is here we ſhall find the moſt diſtant attack expreſſed in the table. Beſides this, we find a boy of 13 whoſe attack is protracted to four months; and a child under ſix years who remains free no leſs than 14 months. Of eight ſeized under a month, ſix are free from the 20th to the 26th day; one to the 18th; two only therefore, which complete the number, can be called very early. Laſtly, when we advert to the male adults, where, if this obſervation be admitted, the protraction ſhould be longeſt, we ſhall find eleven not exceeding one month; ſeveral of theſe between the twenty-firſt and twenty-ninth day; and one, 55 years of age, ſeized ſo early as the nineteenth day.

Another inference, happy in its conſequences, may be deduced from this table; that ſhould a perſon, bitten by a real mad dog, eſcape till the 19th month, it is only as one to a very large majority that he is not infected. Nay, I would venture

ture almoſt to affirm, as a general law, he has but little to fear after the ſixth month; after twelve, perhaps next to nothing; and after the nineteenth, perfect ſecurity. To ſuch as have been bitten, and paſſed this period, this doctrine is comfortable, and muſt relieve them from the dread of ſuſpence; while the opinions hitherto taught, which reſpect an indefinite period, are fraught with an equal portion of laſting miſery. I know an inſtance of ſuch, and believe, that this perſon, for many years, has not had a ſingle week unclouded, and without ſuſpicion.

Should perſons, even at the diſtance of eighteen or nineteen months, become ſubject to the diſeaſe, with me doubts would remain, whether it did not proceed from a ſecond infection, or was induced *ſpontaneouſly*, as from fear, paſſions of the mind, and ſuch like, which has been known to excite a complaint ſimilar to rabid Hydrophobia, and diſtinguiſhed by that name.

PREVENTION AFTER A BITE OR WOUND.

THIS is a matter, perhaps, of more importance, in the treatment of our ſubject, than any that can be brought under conſideration; more even than the mode of introduction of the virus into the habit, and the adjuſtment of the difference of opinion ariſing on the two queſtions lately conſidered[t]. For whether we embrace, in conformity with ſome of the ableſt pathologiſts, the ſide of *irritation*; or adhere to the opinion of the introduction of the virus by the *lymphatics*, the modes of prevention will be equally conſiſtent with each. In this both parties are perfectly agreed. Taking, therefore, this for granted, it remains for us only to examine the different methods recommended for this purpoſe, and appreciate, as far as we are able, their merits.

1ſt. *By ſuction.*

Some authors have recommended ſucking the wounded part, and affirm that no danger can attend the perſon who performs this humane office, as the poiſon muſt be ejected with the ſaliva by which the internal parts of the mouth are conſtantly bedewed, and which, as a further ſecurity, may be waſhed out afterwards with water[u]. Examples are adduced in proof of the ſucceſs of this method in the bites of other poiſonous animals and reptiles, ſuch as the viper, &c. But from the trials of Dr. Mead[w] on the viper, it is evident, that on touching the tongue and lips with this reptile's poiſon, there is danger. This eminent phyſician and ſome other friends, in order to aſcertain its nature, ventured to taſte it diluted with water, and their tongues were inſtantly affected with a ſharp burning heat. One, bolder than the reſt, taſted it undiluted, and ſuffered for his temerity. The inflammation induced thereby did not ſubſide for two days.

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[t] Vide page 32.

Suction did not ſucceed in ſaving the life of a celebrated queen of antiquity. "The unworthy

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[u] This doctrine was entertained by Celſus. "Homo," ſays he, "adhibendus eſt, qui vulnus exſugat." And he adds that experience confirms the practice. "Nam venenum ſerpentis, ut quædam etiam venatoria venena, quibus Galli præcipue utuntur, non guſtu, ſed in vulnere nocent." But at the ſame time prudently cautions, leſt there be an ulcer in the mouth. "Illud interea ante debebit attendere, ne quod in gingivis, palatove, aliâve parte oris ulcus habeat."

L. v. C. 27. p. 309. ed. Amſtelædami, 1713.

[w] Vide Mead's Works, vol. 1.

worthy Octavius, who wiſhed to gratify his vanity by chaining Cleopatra to his triumphal car, vexed to ſee that haughty female eſcape from him by death, made one of the Pſylli (ſerpent eaters) ſuck the wound made by the aſp that bit her." The attempt was fruitleſs; the poiſon prevailed; ſhe was not reſtored. Here then is a ſtrong example of the failure of ſuction.

If it fails in an inſtance ſuch as this, where the viper's or other reptile's poiſon have been infuſed, is it reaſonable to ſuppoſe that it will ſucceed better where the poiſon of a rabid animal is introduced? Granting even that a a perſon could apply ſuction without danger, has it ſufficient power to extract the inſerted virus? In many caſes the teeth penetrate deep, and in various directions, over which the ſuperincumbent parts form valves preventing its return to the ſurface.

Berkenhout, however, affirms its efficacy. The inſtance he adduces proves nothing; for the animal was not mad which inflicted the wound, on one of his children, where ſuction was applied[x]. After the inſtances related, I cannot heſitate in pronouncing that the perſon who

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[x] Vide Berkenhout on the Bite of a Mad Dog.

who performs this humane and well-intended office, performs it at his own riſque; for ſome of the poiſon received on the lips from the ſurface of the wound, may adhere to them, or about the tongue and gums, and from the eaſy abraſion of their epithelion innoculation may follow; or it may be abſorbed through the pores, as has already been ſhown.

2*d*. *By Extirpation, Ablution, and Cauſtic.*

If it be allowed that the doctrine of *abſorption* be eſtabliſhed, and alſo the *locality* of the poiſon for a certain time after the infliction of the wound, according to the law of this particular poiſon, an excellent practical rule follows; a rule that will enable us to prevent the occurrence of the malady at a period conſiderably later than its inſertion. Nothing, however, but want of opportunity when the wound is given, ought to prevent the neceſſary precautions ſoon to be mentioned, for more effectually ſecuring the patient's ſafety; yet, when this has been neglected, it will be a comfortable ſource of rational hope to look forward to an operation, at a diſtance from the accident, to avoid the riſque of loſs of life, which, from want of ſucceſs in curing the diſeaſe, the patient muſt contemplate with horror as an unavoidable event.

Let us ſee what has been done in ſuch caſes; let us examine the facts which ſupport this idea. Firſt, Mr. Loftie had a patient who received the bite twenty hours before the part was extirpated, which is the operation under conſideration. The diſeaſe did not take place.

Second, Of two caſes related by Mr. Foot[y], exciſion was not performed in the one till near twenty-three hours, and in the other not till ſixty-eight had elapſed. Both did well.

Third, It was thirty hours in the caſe mentioned by Doctor Shore[z], before any thing was done to the wound. The patient eſcaped.

Fourth, It was not till after twenty-eight days, from the bite, in the caſe of the young lady at Ipſwich[a], when extirpation was performed. She is now, at the diſtance of three years, in perfect health.

Fifth, In ſpring 1792, and the preceding winter, the county of Suffolk was greatly infeſted with mad dogs, eſpecially round Saint Edmund's Bury. Several accidents happened

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[y] Vide Foot on Hydrophobia.

[z] Vide Meaſe's Eſſay on Bite of a Mad Dog, p. 125.

[a] Vide page 23, note

from them to men and other animals. This afforded opportunities for exciſion at different diſtances from the bite. Some of them fell under the care of Doctor White of that place[b]. In one caſe he cut out the part three days after the accident. The perſon has ever ſince remained well. Seven where bitten by rabid dogs about the ſame time in the neighbourhood. Three of them did not apply till the third day; two came to him on the ſecond day; the other two not till *ſome time* (the period not ſpecified) after the accident. The parts were then extirpated, and they all did well.

Sixth, A foal was treated in the ſame manner, bitten five days before. The animal continued well long after.

On the other hand, the ſame dog bit a horſe, a cow, and two pigs on the ſame day; no exciſion was uſed; and though internal remedies were adminiſtered, the animals were all dead within the month; a preſumptive proof of the ſuperiority of extirpation.

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[b] The Doctor was not inattentive to the advantages that might reſult from this mode. Vide his obſervations on the ſubject, in an appendix to Meaſe's Eſſay on the Bite of a Mad Dog, London, 1793.

Seventh, I ordered two of my patients, Field and ſon[c], near this town, who had been bitten about forty hours, to ſubmit to the extirpation of the wounded parts, which was done. At the ſame time I directed them to chain up the dog, to determine reſpecting his diſorder. The dog died mad on the third day, after ſhowing marks of a moſt violent diſeaſe by fits of the higheſt exacerbation, and fury, exerted againſt the chain that bound him, and the rails of the cage wherein he was confined. The men remain free from the diſeaſe at this day.

From theſe examples we may hope favourably even from late exciſion. But have we

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[c] Theſe are the two perſons mentioned in my firſt edition. The caſes were then too recent for a decided opinion as to the efficacy of the operation. Twelve years and upwards have elapſed, and I may now ſpeak with poſitiveneſs.

This dog had left home a day or two before, and remained abſent about two days; the family miſſed him but knew not the cauſe of his abſence. Soon after his return he committed the accident. He not only ate and drank that day, but likewiſe after being chained. He appeared, on his return, as if fatigued and famiſhed by abſtinence and neglect, and knew the family as formerly; followed his maſter, who went to labour at his farm, and ſlept contiguous as uſual, unſuſpected of diſeaſe. It was on his maſter's walking abruptly up to him that he flew on, and bit him. The ſon was bitten afterwards, in another exacerbation; a farther proof of fits, and intervals in the malady.

reaſon to hope the ſame at the commencement of the diſeaſe; at the re-inflammation of the wound, the harbinger of this awful period? Is the poiſon latent in the part where firſt inſerted till this time? From all parts of the evidence carefully weighed and taken together, I think, there is reaſon to conclude, that an operation, even at this late period, may be ſucceſsful in preventing the approaching malady.

Let us again have recourſe to the analogy of the ſmall-pox. It does by no means appear in this complaint, that the ſyſtem is infected till after the puſtule, *locally* produced by the inſerted matter, has ſuppurated. In the interim the perſon remains in accuſtomed health, I mean from the ingrafted diſeaſe. For in the interim, accidental catarrhal affections have ariſen accompanied with fever. Theſe have been removed by the common means, and health be re-eſtabliſhed before any indications of the inoculated diſeaſe preſent themſelves.

It may be objected to this illuſtration, that a diſeaſe ſeizing the habit while under the influence of another, has for a time ſuffered a ſuſpenſion, till the latter has finiſhed its proceſs, when the former ſpecies of fever again re-commences, and continues its progreſs as at firſt; and that, therefore, this example is inſufficient to prove the total freedom of the habit from the infection, till juſt at the commencement of the variolous fever. This objection will be removed by conſidering what follows.

We obſerve, that at the commencement of abſorption, the inflammation of the inoculated arm ſpreads rapidly, and ſometimes widely round, even in a very few hours; and in a very few more (it may be) ſymptoms of fever are diſcernable. Eyes dull; heavineſs and langour; head-ach; nauſea with vomiting; an acceleration of pulſe, with dry tongue, and thirſt, followed by the proper eruption. Tho' no experiments have hitherto been inſtituted ſo near the acceſſion of fever, to place the ſubject beyond controverſy, yet they are not wanting at an earlier period after inoculation.

It would, indeed, be a nice diſtinction to find the preciſe time that abſorption begins, when the contents of the inoculated puſtule firſt move, from their local ſituation in progreſs towards the heart; yet it is more than probable that exciſion, at this moment, would ſucceed; that the above ſymptoms, from the commotion produced by them in the habit, point preciſely when the virus, through the medium of the lymphatics, mixes with the maſs. Applying this to our ſubject, the inference is, that exciſion ought not to be omitted at any period, from the infliction of the wound by the rabid animal, to the firſt ſymptoms of the approaching diſeaſe; and if done when the part bitten re-inflames and becomes painful, the hopes of prevention would be greater than if done a day or two later, when ſymptoms of the diſeaſe appear manifeſt. I am inclined to think even this a comfortable prop in a malady for which, I ſtill aſſert, that no remedy has to this day been uſeful, no cure performed.

The following inſtance is calculated to corroborate this idea. Dr. Gutherie had a patient at Peterſburgh, who was bitten by a dog. This was a boy, ſervant at that time to the Britiſh miniſter then reſident at the Ruſſian Court. This animal bit two other dogs on the ſame day, both of which died mad in the ſpace of a month. This was evidence of the exiſtence of the diſeaſe in the animal. The wound was in the foot. The Doctor ſcarified it till it bled freely. After this it was dreſſed with ſtrong mercurial ointment for fourteen days; and the ſore was kept open by applying, occaſionally, a ſmall bliſter over the part.

Farther, the wound was dreſſed with Hill's Ormſkirk medicine. By this means the ſore was kept diſcharging for five weeks. It was then ſuffered to heal, and remained ſo for ten days, which comprehended a period of ſeven weeks from the accident. The boy then felt ſhooting pains in the cicatrix; theſe laſted for ſeveral days, and one of the cicatrices began to inflame, and aſſume the appearance which the inciſion of inoculation preſents before the eruption of the ſmall-pox. The Doctor immediately ordered the wounds to be re-opened, and ſtrong mercurial ointment again to be applied. During its uſe, the ſhooting pains ceaſed, and the eruptive appearances ſubſided; the boy remained well long after.

Though this caſe cannot be called a cure of Hydrophobia, that diſeaſe not being preſent, it may fairly be named a prevention; for there were ſtrong evidences of the diſeaſe being ſpeedily about to commence. The treatment was doutleſs highly judicious, and affords almoſt a poſitive proof of the utility of reopening the wound at its ſecond inflammation. The mercury, in this inſtance, I would conſider only as an eſcharotic. Not more than two drams were uſed. The concluſion from all we have ſaid, and which, in a practical view, ought ſtrongly to be inculcated, is, that exciſion ought to be performed as early after the bite as poſſible; yet, ſhould this have been neglected, or impracticable at the time, it ought not to be omitted at any period between this and Hydrophobia, from a ſuppoſition of its being too late.

If it be urged againſt the method, that it failed in the patient's caſe under Dr. Liſter's care, the anſwer is, the diſeaſe was long begun before the operation commenced. The Doctor was not called in time. Two days ſooner it might have had a different iſſue. The attempt was even then meritorious, and reflects credit on his judgment. He only ſcarified the wound, however, and applied a bliſter over the part. This mode, indeed, was not the beſt ſuited to the purpoſe.

The girl that was brought to the royal infirmary of Edinburgh in 1765, had her arm ſeared with a hot iron over the ſcar, immediately on being received into the houſe. It proved, indeed, ineffectual; it was at too late a period. There had been ſymptoms of Hydrophobia for two days before. Some would have objected to the method, even if proſecuted earlier. The actual cautery carries with it much terror; the ſcar made thereby will always remain unſeemly; neither can it be applied with conveniency, nor even ſafety, to ſeveral parts where bites may be received; and the length of time conſumed in the operation, and the conſequent augmentation of pain, ſtrongly militate againſt it, even allowing that the efficacy was equally powerful. The ancients, indeed, not only extolled, but practiſed it; and ſome of the moderns of reſpectable reputation, have ſet it forth as having, over other means, great ſuperiority[d].

In the following caſe its ſucceſs ſeems to have been complete. This is related by a clergyman of character---"I know," ſays he, "a quarter-maſter who had been bitten three times by mad dogs, and always cut out or *burnt* the part wounded. One time was early in the morning before people were ſtirring. Seeing a blackſmith's ſhop open he ran in, and ſnatching the red hot iron from the workman, thruſt it into his leg, to the great ſurpriſe of the man, who thought him mad[e]."

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[d] Vide a Paper in the Memoirs of the Royal Medical Society at Paris for 1783.

We have already ſeen the great probability of being able to interrupt the progreſs of the variolous matter by exciſion, prior to the commencement of the eruptive fever; and a probability, equally ſtrong, authoriſes a ſimilar practice where wounds have been received from rabid animals. The analogy is ſtrong; they are both innoculated poiſons; and according to the reaſons already advanced, reaſons ſufficiently powerful, in the opinion of ſeveral, both enter the ſyſtem through the ſame channels.

Since the firſt edition of this work, we have to lament the death of four more of our fellow creatures in this neighbourhood[f], from this malady, and many in other parts of England. Scarcely a month, indeed, paſſes without reports of accidents of this kind. Exciſion was not performed on either of theſe four, and to each of them, I believe, ſome ſpecific was adminiſtered to which they blindly truſted their lives[g]. To one of theſe (January, 1789) I was called in the laſt agonies of his exiſtence, but as I was about to ſet out for his habitation, a ſecond meſſenger arrived with intelligence of his death. The reader, on peruſing the caſe, will find it differing but little in its ſymptoms from the greater number related.

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[e] Rev. Mr. Aſhby's letter, September, 1796.

[f] Ipſwich, Suffolk.

[g] Vide Appendix.

In removing the bitten part, much care and judgment are requiſite. It cannot be doubted but a few failures, of which we read, aroſe from want of attention to the minuter circumſtances in the operation. On removing the piece, the under ſurface ſhould be carefully examined to find whether the wound penetrated through. If this be diſcovered, a deeper piece ſtill ſhould be taken out, ſo that no mark whatever of the tooth be perceived, but the under ſide be pure and ſound. For ſhould the leaſt ſpeck be left, which had been touched by the poiſoned tooth, there will be no certainty of ſafety; the operation will prove nugatory. I ſpeak of recent injuries; but if days have elapſed, the enſuing inflammation, in the progreſs towards cicatrization, will alter the appearance, and render other cautions neceſſary.

Mr. Hunter, on cutting out the piece, in one caſe, examined the under ſurface; no marks of a tooth were perceptible. But on examining the ſuperficies of the wound from which the piece was removed, he obſerved a part in the middle hollow underneath. This was proof of his not having cut ſufficiently deep, and nothing but this nice examination could have convinced him to the contrary[h].

I ſhall, without heſitation, then, recommend, and would enforce it, were I able, a piece to be cut out round the part wounded, making the inciſion at the ſame time pretty deep, to prevent accidents, from leaving any of the animal's ſaliva behind. I can ſee little cruelty in this, when we compare ſhort temporary pain to the dire ſcene that we have reaſon to expect.

The ancients recommended a ſimilar treatment, which modern authors, copying from them, adopt. Mead, among others, though ſo confident in his ſpecific, readily aſſents to this method.

Dr. Cullen, alſo, coincides in the ſame opinion.

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[h] Mr. Home gives Mr. Hunter the merit of being the firſt who performed exciſion in this country the time; is not ſpecified. Vide Home's account of the life of Mr. Hunter, prefixed to his poſthumous works.

nion. “ In this,” he allows, “ every body agrees; but with this difference, that ſome are of opinion that it can only be effectual when it is done very ſoon after the wound has been made, and they, therefore, neglect it when this opportunity is miſſed[i].”

With reſpect to the actual cautery, enough perhaps has been already ſaid[k]. If ſufficient ſubſtance be deſtroyed it will doubtleſs be effectual, but many reaſons weigh with me in giving preference to the knife. The part being deſtroyed, in either of theſe ways judged proper, and the patient ſubmits to, it has generally been recommended to keep up a diſcharge for a conſiderable time after. Dr. Fothergill attended two perſons, the maſter and the maid ſervant, bitten by a mad cat, the maid's wound did not heal up, though endeavours were uſed for that purpoſe, for ſeveral weeks. The little ſcratch received by the maſter ſoon healed. He became affected with Hydrophobia and died; the ſervant eſcaped. Hence the propriety of keeping ſores open has of late been urged. In the caſes, however, wherein I am conſulted, I now omit it; becauſe, on reflection, I find no good reaſon to offer for this injunction. For if, as we hope from the previous accuracy in the operation, no poiſon remains, where is the utility of keeping a ſore open? Even ſuppoſing the poiſon had not been all removed by the knife, it ſeems doubtful whether this method could eliminate from the ſore the remaining venom. We know that in every open ſurface there is an abſorption: a wound cannot cicatrize without it. The inflammation kept up by this proceſs, there is reaſon to believe, will quicken the action of the veſſels, and a change may be produced favourable to a *ſpeedier*, inſtead of a *retarded* abſorption, whereby the entrance of the poiſonous particles into their mouths will be accelerated. I have ſeveral examples to offer where the ſore, after exciſion, was ſuffered to cicatrize *ſpeedily*, and the proceſs haſtened by ſurgical means, both from my own experience, and from the practice of others; where ſafety was as equally and completely inſured, as if the wounds had been turned into a running ulcer, not for forty days only, but for as many months.

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[i] Vide Firſt lines vol. 4, p. 109.

[k] Vide page 139.

I ſaw, about ſeventeen years ago, three caſes of this kind. Theſe perſons were all bitten by the ſame dog, in about ten minutes from each other, (the animal was certainly mad) and in leſs than a quarter of an hour more, the operation was performed in the hoſpital where I then attended; no Hydrophobia ever appeared.

In 1789 ſix perſons where bitten by a dog, viz. three men and three children. The dog died mad next day. I was conſulted by one of the patients for himſelf and his five fellow ſufferers, and theſe means were ſtrongly inculcated, which I have reaſon to believe were not neglected; for the alarm through the country at this time was great from numerous accidents of the ſame kind. It may not be improper to notice, that this animal also ate food juſt before his death, as this has univerſally and erroneouſly been made a diſtinguiſhing mark of freedom from infection.

In February, 1790, another perſon conſulted me who had met with a ſimilar accident. He had been bitten the day before by a dog ſuſpected of madneſs; and in ſpring, 1791, a third applied on the ſame account. They all received the ſame directions; no running ulcer, but exciſion merely, was inſiſted on. From the frequency of theſe accidents and want of ſucceſs in curing the diſeaſe, prevention be-

comes

comes a matter of the higheſt importance. I do not go ſo far as to aſſert that every perſon operated on, is indebted to it for his life, becauſe it is impoſſible to decide whether the poiſon would in every caſe have been active; but where ſo much is at ſtake we ſhould act as if we were certain, in every inſtance, of the poiſon taking effect.

Cupping and ſcarifying, or burning gunpowder in the wound, have all been uſed, and warmly recommended; but extirpation, where the part will admit of it without danger or much deformity, is always preferable.

Sometimes it happens that the part bitten is unfavourable for extirpation. This is the caſe when large wounds are received either in the lips, or about the face. In theſe parts a ſpeedy cicatrization is deſirable to prevent the deformity, which muſt ſucceed ſores long kept open, where the baſes are enlarged, and the loſs of ſubſtance becomes greater; and, if with the precautions already delivered, the wounded ſurfaces be removed, there can be little room for future apprehenſion.

Extirpation either in the upper or under lip, has likewiſe inconveniences; a ſcar from a large wound muſt remain altogether unſeemly, diſfiguring the countenance.

This was the part bitten in the unfortunate caſe of Maſter Rowley. Cauſtics, however, were applied, ſoon after it was received. That they did not ſucceed might in part ariſe from the cauſtic not having touched every part of the wound; but with as much probability from ſome of the dog's ſaliva adhering about the gums or inſide of the lip, from whence it was afterwards abſorbed; for, "the lip was torn a good deal. The teeth" (of the dog) "had gone through and through, and had torn out a piece[1]."

In ſuch caſes rhe Phyſician has a moſt difficult part to act. If he pays too great attention to appearances, he may fall into the oppoſite extreme, and loſe his patient from lenity and regard to his looks. If he boldly adviſes extirpation, and his patient ſhould ſurvive, he may not eſcape cenſure, but incur his diſpleaſure through life for disfiguring him.

The moſt unfavourable places are about the face; and of theſe, the cheeks, noſe, and lips are moſt ſo. The fore part of the neck alſo, is not without inconveniences, yet it is better to uſe the knife on ſuch occaſions,

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[1] Mr. Hunter's Letter to the author.

ſions, than to ſuffer the patient to fall a ſacrifice without attempting ſo rational a prophylactic. Should the worſt take place, we have diſcharged our duty without truſting to chance for an eſcape.

M. Sabatier's patient, a gardener, was bitten in 1764 by a dog on the upper lip. The wound was trifling, and was dreſſed in the common way. Next day the ſame dog bit a young man, and ſcratched him in ſeveral places. He had no fewer than *twenty five wounds*; and ſome of them conſiderable. Beſides theſe, they reckoned fifty ſcratches. *Twenty eight hours* after the accident, M. Sabatier applied butter of antimony to the wounds. Theſe were kept open a conſiderable time, and he eſcaped the diſeaſe. Was it to the cauſtic, or the ſubſequent diſcharge, that the patient owed his life? I heſitate not in attributing it to the former. The gardener was leſs fortunate; nothing was done to him, and on the *fifty fifth* day from the bite, he took the diſeaſe, and in two days after was dead.

In 1775, M. Sabatier had another patient, who had ſuffered from a ſimilar accident. The cauſtic was applied in this caſe with happy effects. This patient was a ſoldier. But another

other perſon bitten by the ſame dog and neglected, was ſeized with the diſeaſe on the *fifty ſecond* day from the bite, and in *twenty four* hours after he alſo died.

The method of uſing cauſtic followed by M. Roux, has many advantages, though ſuffering the wound to bleed, as a part of the practice, after deep dilatation, can add nothing to the patients ſafety. He does not apply his cauſtic, which is deliqueſcent butter of antimony, till next day, when the wound has ceaſed to bleed. This precaution is judicious; for the blood would dilute and weaken the cauſtic; but applied in this way it will penetrate at leaſt two lines deep. The cauſtic being received on a wooden probe, is thruſt to the bottom of the wound. He extends it not only to every part of it, but likewiſe over the adjacent ſkin; and then over the whole is applied a bliſter. When in this manner a deep ulcer is produced, by the aſſiſtance of peas, a diſcharge is kept up for forty days.

Profeſſor Mederer's (of Friburg) method of treating caſes of this kind is almoſt on the ſame principle, though with the formula of ablution. It conſiſts of waſhing the wound

well;

well; firſt with a diluted ſolution of lunar cauſtic in water; (half a drachm of the cauſtic being added to a pint of water) and afterwards in warm water alone; and this he directs to be repeated. This may be conſidered as a powerful detergent, and in this light judiciouſly uſed. Would not the cauſtic afterwards applied over the ſurface be a proper meaſure, and a further ſecurity?

As the bite ſerves only the purpoſe of inoculation, the danger will be various according to the formation alſo of the part in which it is given; if leſs vaſcular, it is leſs; if more, it becomes the greater. From a review of all the evidence, I am inclined to think, that the diſeaſe comes on ſooner in the inſtances of infliction among numerous veſſels.

In 1790, a bitten perſon was brought to Dr. Weſtern; this was in Jamaica where the Doctor then reſided. The wound was *dilated*, and mercurial ointment mixed with common turpentine applied. This brought on a large diſcharge. Wine, and the peruvian bark in ſubſtance and in large quantities, were adminiſtered for eight days, gradually increaſing the doſe. Six months after the boy remained well; and the Doctor attributes the cure to the wine and bark.

The dog's madneſs was proved by his having bitten two ſheep at the ſame time, which in ten days after died highly rabid. Every part of the practice in this caſe might contribute its ſhare towards prevention; and allowing infection to have exiſted, it chiefly derived its efficacy from the eſcarotic, with which the wound was treated, and which deſtroyed its ſurface.

When the cheek has been wounded and penetrated through, by which means ſome of the poiſonous ſaliva muſt have touched the inſide, and thus eſcape the knife, the cauſtic, or other means uſed, we ſhould order the patient, provided we ſee him ſoon after, to waſh and ſcour the inſide of the mouth with detergents; ſalt and water, a ſolution of kali, &c. and this ſhould be often repeated, uſing a piece of ſponge to abſorb the moiſture, carefully waſhing it after each application, while the knife, or proper cauſtics, are externally employed to deſtroy the adjacent lymphatics about the wound.

With reſpect to detergents in recent wounds of this nature, no doubts of their utility can be entertained. A cat became mad, flew upon her miſtreſs, and bit her. The maid, who was waſhing linen at the time, ran to her aſſiſtance; laid hold of the animal to diſengage it, and in the ſcuffle received a bite in the arm; but with the courage, or careleſſneſs that perſons in her ſituation ſometimes happily poſſeſs, returned to her waſh-tub without farther attention to it. The miſtreſs took the diſeaſe, and periſhed in conſequence; the maid eſcaped[n]. In purſuing her labour, the wound was well waſhed by the ſoap lees, and its detergent quality, it may be affirmed, proved a preventative by removing the ſaliva from the abraded ſurface.

Cupping may be uſed alſo; but in caſes of this kind, I do not ſee what advantage is to acrue from ſcarification merely; yet, if it be conſidered of material importance by the operator, I have no objection; for it is better to do too much than too little where ſo much is at ſtake. If, after uſing theſe means, we ſhould not ſucceed, we know the obſtacles, and can pronounce them beyond the reach of human ſkill.

Dr. Haygarth has laid down ſome uſeful

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[n] Mr. Aſhby's Letter.

rules for waſhing the wound. The death of three men from this malady, in the autum of 1788, induced him to turn his attention to it. He lays conſiderable ſtreſs on the manner in which ablution is performed. Where the knife cannot be conveniently uſed, his method certainly bids fair to ſecure the patient from future evil. Firſt, he directs the ſaliva to be carefully wiped from the part with a dry cloth; and afterwards to waſh the wound with cold water, not ſuperficially, but with the moſt perſevering aſſiduity, for ſeveral hours. After this, he thinks warm water may be uſed with advantage, which is to be done by pouring it on the part from the ſpout of a tea-kettle in a continued ſtream. He ſhows the importance of careful ablution by pointing out, that if the poiſon was of a dark dye, like ink, "we ſhould all be aware that plenty of water and patient diligence would effectually waſh it out," for we could judge of it by the dye. If this method be neglected till an inflammation of the part has taken place, the ſurface ſhould then be ſhaved off, and cupping glaſſes may be uſed. In bad caſes the wound ſhould be deeply opened, and dilated in every part. To ſhow the importance of diligent ablution, he draws an argument from the inoculation of the ſmall-pox, where an attempt was made to waſh the poiſonous matter away, to prevent the diſeaſe, nevertheleſs it appeared at its proper time. This would not have been the caſe[n] had the ablution been properly performed, but inſtead thereof, it was done "ſecretly, haſtily, and timidly by a female hand."

Mr. Hunter placed his chief dependence on the lunar cauſtic in the caſe of Maſter Rowley[o]: it failed. Several reaſons may be offered for the failure without implicating cauſtics in general.

1ſt. The part was unfavourable, for it was the lip; and this, alſo, cut quite through, where ſome of the dog's ſaliva muſt have fallen on the gums, or been ſcattered to ſome diſtance over the inſide of the cheek, &c. "The lip was tore a good deal----the teeth had gone through and through, and had tore out a piece."

2nd. Though all the part had been deſtroyed, yet ſince ſome of the particles of the infected ſaliva might have been thrown beyond it, and, of courſe, beyond the reach of either knife or cauſtic, it was not in the power of man to ſay where to find it. Granting theſe, it proves no more than what has been already admitted; that there are ſome parts more than others, unfavourable for exciſion, cauſtic, or cautery. The legs, the arms, the thighs, the trunk of the body, and even the fore part of the neck, or the face, will admit of exciſion, &c. The cheeks, lips, and noſe are the chief places where exciſion may be doubtful.

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[n] Vide Haygarth's Letter to Percival.

[o] "My whole dependence was on the cauſtic, but did not object to the others (Ormſkirk and Tonquin noſtrums) being given." Letter to the author, 1785.

Another inſtance, however, has lately happened of the failure of extirpation, which may give riſe to farther doubts; but let the reader pauſe and examine it with accuracy[p]. He will find reaſons, I apprehend, for ſuſpending his cenſure againſt the operation. Though the ſurgeon ſeemed to have performed it with ſkill, and with accuracy, and, as it would appear, cut ſufficiently deep, yet no detergent was uſed immediately after to cleanſe the ſurfaces of the new wound, but the lips were directly brought together by ſuture. I do not, however, go ſo far as to ſay that ſaliva was left behind, but it has already been ſeen by Mr. Hunter's operation, how much nicety and accuracy of obſervation is neceſſary for ſucceſsful extirpation [r].

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[p] Caſe of Hogg. Vide Med. Comm. D. ii. vol. 10.

Hogg had two wounds; one in the calf of the leg, the other in the hand, to which exciſion and ligature were applied. A third remained, but it being a mere ſuperficial ſcratch, Mr. Johnſton thought it ſufficient to touch the ſurface with lunar cauſtic. In this he acted as ſome eminent men have done.

It is impoſſible to pronounce, with certainty, from which of theſe three injured parts the diſeaſe took its origin; but I am inclined to ſuſpect that it aroſe from the ſcratch to which the cauſtic was applied. The precautions which Mr. Johnſton uſed would appear to leave leſs room to ſuppoſe that venom was left in the wound, notwithſtanding the omiſſion of ablution after exciſion. The lunar cauſtic is weak, and the time neceſſary for throwing off the eſcar, after which it can only be re-applied with effect, renders it ill adapted for the preſent purpoſe. From my remarks on this caſe, I am far from having it underſtood as conveying the ſmalleſt reflection on this ſkilful Surgeon. Similar means (viz. lunar cauſtic) have failed in the hands of others, as we have ſeen, whoſe knowledge cannot be diſputed, and whoſe circumſpection ſeldom forſook them; but it becomes more than commonly difficult, in multiplied and complicated *rabid* wounds, though abſolutely neceſſary for ſucceſs, to catch every minuter circumſtance.

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[r] Vide page 141.

With reſpect to cauſtics, in theſe caſes, one general remark may be made, viz. that the ſtronger, not the weaker, ſhould be had recourſe to. Whatever diſſolves animal ſubſtances moſt perfectly and ſpeedily, penetrating deep, is the fitteſt for the preſent purpoſe.

The kali purum is of this kind. It forms immediately an eſcar to ſome depth, which may be immediately removed by a ſpatula; and by re-application of the cauſtic, another be taken off; and this being repeated, removing ſtratum after ſtratum, we proceed to the depth intended. In this mode of uſing cauſtic it would ſeem equally ſafe and equally ſucceſsful with exciſion by the knife.

3*d*. *By Specifics*.

In all ages, from almoſt the firſt appearance of the diſeaſe, men, as it was natural, began to turn their thoughts not only towards its prevention, but its cure. Various were the ſubſtances which ignorance and ſuperſtition, in conducting this reſearch, led them to propoſe. That their inveſtigations were not crowned with ſucceſs, are too well known; and although the darkneſs of former ages, with reſpect to ſcience, might be an apology for introducing the numerous train of inert trifles, termed ſpecifics, which their practice preſents; yet later times enjoying the advantages of more enlightened inveſtigation, amidſt the various and luminous diſcoveries which patient labours have produced, can boaſt of having penetrated but little farther than the ſages of 2050 years ago[s], into the abſtruſe nature of this dreadful malady.

Specifics have abounded from their days, down to the preſent. The word has ſomething faſcinating in it; and when pronounced, reaſon ſeems to deſert her abode. The underſtandings of the greateſt men of the reſpective ages in which they flouriſhed became clouded, howſoever penetrating in other inveſtigations, when this idea took poſſeſſion of their minds. No illuſtration is neceſſary to prove this. The variety of ſpecifics, their ever-changing compoſitions, and their conſtant failures, ſtand forth as the monuments of their inſignificancy, and the truth of this obſervation. Much miſchief have they produced; while a ſingle inſtance of advantage, howſoever loud their inventors may have proclaimed the contrary, cannot be fairly and openly brought forth in their favour to ſatisfy rational inveſtigation; therefore, without apprehenſion of a miſtake, I diſmiſs them all as nugatory in the extreme.

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[s] The time, according to ſome, when the diſeaſe firſt appeared.

Let no faith whatever be placed in *ſpecifics*, and certain *preventatives* ſo called, for it will be truſting to a broken reed, to a ſtaff inſufficient to afford ſupport. Experience has proved them fallible and trifling; for, from a knowledge of the compoſition, it is not difficult to demonſtrate that ſuch ingredients as compoſe them, are ſingly or unitedly, altogether inadequate to oppoſe the evil.

We ſhall, therefore, paſs over that of Æſchiron, compoſed of burnt crabs, as mentioned by Galen, and Oribaſius; the famous opiates of Scribonius Largus; the boaſted powder of Palmerius; that of turpith mineral ſo much extolled by James; the tin and mithridate, on which Myern and Grew beſtow ſo much praiſe; alſo the root of the dog-briar or roſe[s], ſaid to be diſcovered in holy viſions; the liver of the mad dog broiled and eaten; the pimpinella (burnet) of Henry II. King of France, which he is ſaid to have diſcovered on his death bed to his phyſician Fernelius, with ſeveral others. Yet it will be neceſſary to take ſome notice of two or three ſtill high in eſtimation with the public; and extolled, even at this day, by ſome phyſicians of abilities and learning.

One of theſe, claiming our ſpeecial attention, is the *Ormſkirk* medicine. Its reputation has ſtood high for many years, and it is ſtill held as infallible by many, eſpecially in the northern and weſtern diſtricts of England.

Dr. Fothergill was amongſt the firſt who conceived doubts reſpecting its virtues. The melancholy caſe of his patient Mr. Bellamy, for whom it was procured of the perſon authorized to ſell it, and uſed according to the printed directions, gave grounds for ſuſpicion, which its fallibility in many caſes ſince has ſerved to confirm. Let us examine of what this celebrated noſtrum is compoſed. According to the analyſis which it underwent ſome years ago, we ſhall not find in it a ſingle active ingredient.

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[s] Spongia Cynnorhodia: P. Boccone wrote a treatiſe on its virtue. The Scicilians call it Sanatodos (All Heal). It is called by us Dog-roſe, becauſe celebrated in the cure of *rabies canina*. The part uſed is an excreſcence growing about the root.

In the year 1777, Dr. Heyſham, who wrote his Inaugural Diſſertation on *Rabies Canina*, inſtituted five experiments for the purpoſe of diſcovering its component parts. Theſe were made with the ſimple addition of water to the nitric and ſulphuric acids. They were repeated by Profeſſor Black with the ſame reſults, and conſequently there can remain little room for ſuſpicion of inaccuracy. From theſe it appeared, that the baſis of the medicine was chalk; and relying on its powers, a theory was hazarded relative to the nature of the poiſon of the rabid animal, which it is not our buſineſs here to examine. In a word, from the analyſis of this eminent profeſſor and his pupil, the whole compoſition is as follows, viz.

Half an ounce of powdered chalk.
Ten grains of allum.
Three drams of Armenian bole.
One dram of the powder of elecampane root,
And ſix drops of the oil of aniſe.

Such

Such is the medicine on which the public has placed implicit confidence!!

I need not inform my medical readers, that chalk is a mere abſorbent; that allum is an aſtringent; that Armenian bole likewiſe poſſeſſes a degree, though ſmall, of aſtringency; and that the root of elecampane is conſidered as ſo inſignificant a ſubſtance, that the colleges have long ago rejected it from the number of the articles of the *Materia Medica;* and as to the addition of a few drops of the oil of aniſe, it can be of no other uſe than to warm the medicine, and give it a more grateful flavour.

Next in order of celebrity comes the Tonquin medicine, a noſtrum ſome time ago in equal eſtimation. What then ſhall we ſay of it? Little more than of the former. We owe it to the well-meant, though miſtaken endeavours of Sir George Cobb, who many years ago brought it from Tonquin, whence it derives its name, as of ineſtimable value, and as conſtantly infallible amongſt the Chineſe; but experience in many inſtances ſhows the contrary, and proves its inefficacy. Let us examine its compoſition. We ſhall find it to be only 24 grains of native, and as many of factitious cinnabar, with 16 grains of muſk. Theſe are powdered and mixed together.

ther. No farther comments, it is apprehended, are neceſſary on the ſubject.

Muſk is an antiſpaſmodic; ſo far it may ſeem uſeful in a diſeaſe, ſuch as *Hydrophobia,* where ſuch violent ſpaſms take place in the throat, face, &c. but it has not ſufficient power to oppoſe, and remove the malady. Yet we muſt own that the Tonquin appears a better medicine than the Ormſkirk, ſince it poſſeſſes a ſmall portion at leaſt of one active ingredient.

With reſpect to Dr. Mead's famous powder,[v] I ſhall only mention, that it was a compoſition of aſh-coloured ground liver wort,[w] and black pepper. The former was the ingredient on which he depended, and to which the virtues of the powder were attributed. *Materia Medica* writers tell us, that this lichen is a warm diuretic; but from the taſte little or no warmth can be diſcovered; and it is a general rule which, we believe, holds good in the vegetable kingdom, that where little or no ſenſible qualities

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[v] Pulvis antilyſſus, or mad wort. This powder was diſtinguished by this name from the herb alyſſum, which was ſuppoſed a ſpecific againſt the bite of a mad dog.

Two ounces of the Lichen ciner. terreſtr.
One ounce of piper nigrum
Were beat together, and formed this powder.

[w] Lichen cinereus terreſtris. Linn.

are diſcoverable, little or no virtues for the removal of diſeaſes are found.[x]

This medicine was a ſubſtitute for the jew's ear of Dampier. The principles on which the cure was attempted by ſeveral antient phyſicians were thoſe of diuretic. Whatever, therefore, poſſeſſed this quality in a ſuperior degree, they adopted. One of them[y] uſed even cantharides in ſubſtance, and in quantities which produced bloody urine.

The ſame theory was adopted by Dr. Mead, in the compoſition of his powder, and we have in this noted ſpecific only one ſuppoſed diuretic ſubſtituted for another.[z] His uſe of the cold bath was even upon the ſame principle; for, according to his explanation, its chief action was a conſtriction of the ſurface whereby "the humours were thrown upon the kidnies."

This powder was afterwards inſerted in the *Pharmacopeia*, and on the pompous authority of its ſucceſs in *thirty* years practice; but an addition of *fifty* years more proves, beyond a doubt, its inſignificancy. Nor did this eſcape the penetration of Boerhaave, who ranks it amongſt thoſe inſignificant trifles, calculated only to deceive whoever place their truſt in them. To collect, and relate the caſes in which this has failed, would be ſuperfluous; they are many, and the public have at length conſigned it to merited oblivion.

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[x] Inſipidæ et inodoræ vim medicam vix exercent. Linn.

[y] Ætius.

[z] Lewis's New Diſpenſary.

If we examine the accounts of Hydrophobic caſes, we shall likewiſe find ſeveral where the Ormſkirk medicine has been attended with no better ſucceſs; ſufficient, in my opinion, to induce us to hold it in a very inferior light. Had we only that of Mr. Bellamy, it ſhould leſſen our faith in it; as one poſitive proof of failure is worth one hundred negative proofs of its ſucceſs; ſince it becomes impoſſible to tell whether the bitten perſon, to whom it had been adminiſtered, would have become affected with the diſeaſe; whether it had any ſhare as a prophylactic. But we have three more of its failure, related by Dr. Vaughan. In the inſtance of Maſter Rowley both it and the Tonquin, as alſo mercury were adminiſtered, with ſtrict attention, from a few hours after the accident, till ſymptoms of Hydrophobia appeared.[a]

It has been ſaid, that botaniſts are more intent after *ſpecifics* for the bites of poiſonous reptiles than other men.[b] They cultivate an amiable

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[a] Since this time it has failed in many other inſtances, ſufficient to condemn it for ever.

[b] Vid. Amer. Phil. Tranſ. v. 3.

ble branch of ſcience; and if in this they err at all, it is ſo far pardonable, as it ariſes from a wiſh to be uſeful. What is ſaid here of poiſonous reptiles will apply equally to rabid animals. But let not credulity lead us from inveſtigation, leaſt the only means to obviate the malady be overlooked, and opportunity of ſaving life loſt. I am unwilling to denominate any remedy a *ſpecific*. The Peruvian bark, though its exhibition be attended with ſo much ſucceſs in intermittents, and ſome other ſpecies of fever, is not *ſpecific*, for it frequently fails; and other kinds of bark, and ſome mineral ſubſtances are diſcovered to be equally powerful. We are ſufficiently acquainted with the virtues of arſenic in diſeaſes of marſh effluvia, or where *tonics* are indicated. I am not even inclined to call mercury a ſpecific, I mean in the removal of *lues* venerea. There are many caſes which it does not cure, at leaſt without auxiliary medicines. Let us endeavour to inveſtigate the nature of the changes that enſue in the habit in conſequence of theſe diſeaſes, a knowledge of the remedy will then follow. True philoſophy will in due time baniſh them along with the other hobgoblins of the darker ages.

I am ſomewhat ſurpriſed, however, to find an author, who has ſlightly touched on this diſeaſe, and who, perhaps, has alſo read the firſt edition of this work, argue for the efficacy of the Ormſkirk noſtrum.[b] He draws his concluſions from *two* caſes, and from them adheres to the belief of its virtues, and even blames thoſe who would *diſturb* the public faith on this ſubject. Let us hear how he proceeds. The perſons bitten whom he ſaw were two boys; the dog that bit them was proved to be mad, for he died of the diſeaſe; as did ſeveral others, the Doctor tells us, which the animal had bitten. Both of theſe patients took Barton's *Ormſkirk* medicine; the wounds were dreſſed with it. One of them was bitten on April 10, and on October 11 following he remained well. The other was bitten on May 30; his wounds were dreſſed with Hill's and Berry's *Ormſkirk* medicine; and a doſe of it was given him. This author reaſons as if the boys had really been infected, whereas it is plain they never were; becauſe, to grant this noſtrum cured them would militate againſt every caſe of real infection, in which the medicine has ever been adminiſtered. The caſe, indeed, ſeems to refute itſelf, as he has related it; for *two different ſorts* of the medicine were uſed; one called *Barton*'s, and the other *Hill*'s and

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[b] Dr. Robertſon's Obſervations on Fever, p. 457.

Berry's, two rival venders, and at variance. The *noſtrum* then was not the ſame in both caſes, yet both were cured, or remained free from the diſeaſe by theſe different compoſitions; and ſo they would had they taken inſtead of it a little crab's-claw powder, for they were not infected.

"I cannot foreſee any good purpoſe," he goes on, "that the declaration of this eminent ſurgeon's[c] opinion could anſwer; but, I fear, contrary to his intention, it might have done great miſchief, had it been ſuffered to paſs unnoticed; ſo many unfortunate people having been bitten, and done well from taking the *Ormſkirk medicine*, has ſo deſervedly placed it high in the public faith, as a cure for canine madneſs, that *any* attempts to deſtroy this *faith*, without communicating a ſubſtitute more to be depended upon than this Ormſkirk, is, in my humble opinion, neither philoſophical nor juſtifiable." I draw exactly the contrary concluſion, and would think it highly juſtifiable to deſtroy *blind credulity*, ſatisfied without inveſtigation, and holding abſurdities for truths. If we continue our confidence in what daily fails, where is the proſpect of exertion in queſt of more efficacious remedies?

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[c] Perhaps this alludes to Mr. J. Hunter, for no name is mentioned.

Dr. Percival attributes more to this noſtrum than might have been expected from ſo philoſophical a phyſician; and his authority would likely have ſtamped ſome credit on it had he not, at the cloſe of ſome ingenious arguments, given up the ſubject, and apologiſed for what he had juſt ſaid.[d]

Hear what Mr. John Hunter's experience compels him to advance reſpecting not only this, but likewiſe the Tonquin noſtrum. "All the means recommended were uſed in Maſter Rowley's caſe. I ſaw him a few hours after the bite. He took the Ormſkirk medicine by the direction of Mr. Berry, who ſells it; therefore we muſt ſuppoſe it was properly given. He alſo took the Tonquin medicine, viz. muſk, cinnabar, &c. as alſo rubbed in mercurial ointment till his mouth was ſore."[e]

From all theſe authorities the inference is obvious, that theſe long-boaſted remedies are totally deſtitute of the virtues for which their abettors and inventors have ſtrained to gain them credit.

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[d] Vid. Hints to Dr. Haygarth on Canine Madneſs.

[e] Letter to the author, 1785.

4th. *Vinegar.*

This has of late been recommended as another preventative. Dr. Moneta[f] is among the number who extol its virtues. He aſſerts his having prevented the diſeaſe by it in more than ſixty caſes, when uſed as he directs, immediately after the bite, and for nine ſucceeding days, as an external application to the wound, which is to be previouſly waſhed with warm water, cupped, and ſcarified. He mixes it with a fourth part of melted butter, and dipping therein compreſſes, binds them over the part, renewing them frequently. While this proceſs goes on, an ounce and a half at a doſe, is frequently adminiſtered internally; and this is continued till about the 15th day, not thinking it neceſſary, however, to keep the wounds open longer than the 9th day. The diſeaſe, he aſſures us, has been ſtopt at its commencement by the ſame means. Did experience in the hands of other men furniſh ſimilar events, the diſcovery would be as valuable as the method is ſimple.

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[f] Phyſician to the King of Poland, who has lately written on the ſubject.

Vinegar has alſo been applied in Italy, and equally extolled; but ſince that we are informed it has failed there in one inſtance; and I am apprehenſive, the inference to be drawn is, that in thoſe caſes wherein its ſucceſs was announced, there exiſted no rabid infection; and that in this caſe, where rabid infection operated and proved fatal, the infallibility of the remedy was put to the teſt.

At Warſaw it had likewiſe a tolerable fair trial in two inſtances.

Eleven perſons out of ſeventeen were committed to the care of Dr. Wolf. He did not neglect this opportunity of putting to the teſt the moſt noted ſpecifics which were recorded, or were faſhionable at that time. It was the 9th day after the accident when they applied. He made deep ſcarifications in their wounds; uſed careful ablution, warm fomentations, with vinegar, ſalt, and theriaca; and kept open the wounds for 80 days, in thoſe who lived ſo long. Every 14 days copious V. S. was uſed; and every 7th day, a ſtrong cathartic of ſalts and jalap adminiſtered. Their diet was chiefly vegetable; their drink only whey and water. The herb matriſylva, in as large a quantity as could be procured, was recommended, which they daily ate. They likewiſe ate plentifully of the herb anagallis (flore puniceo) another noted ſpecific; and at the ſame time did not omit the famous compoſition of Palmerius. Beſides this, which was the general treatment, two were daily rubbed with a dram of mercurial ointment, and were purged with calomel. To two others were daily preſcribed four ounces of vinegar, three drams of the tincture of poppies; and at night they were ordered half an ounce of rob ſambuci. Another took every day ſixteen grains of camphor, four ſcruples of nitre; and at night half an ounce of the ſame rob. Two others took twenty-four grains of muſk, with fifty grains of cinnabar; other two took from forty to ſixty drops of ſpirit of ſal ammoniac, prepared with quick lime; and the laſt took a ſcruple of chryſtalliſed ſalt of tartar prepared by the mixture of a little ſpirit of ſal ammon. with a ſolution of that ſalt.

An officer, one of the number bitten, came into the city on the day after the accident, and had the beſt advice the place afforded; beſides which, as a preventative, he took the bark and camphor very copiouſly; yet, in the 7th week he was ſeized with the diſeaſe, and died. One of thoſe under the vinegar courſe fell ill on the 33d, and died hydrophobic on the 36th day. They vomitted and bled him copiouſly, but without effect. The other, an old man, is ſaid to have recovered after an indiſpoſition which they attributed to the diſeaſe. He was purged and bled, and took beſides morſulæ balſami Peruviani, and drank lemonade. After his recovery 100 drops of ſp. ſal ammon. were daily taken. A curious remark is added reſpecting this man. It is affirmed, that the blood drawn during this illneſs, which was certainly not hydrophobic, had a very fœtid ſmell. This, perhaps, might be attributed to the balſam, and other medicines uſed.

The man to whom the camphor, nitre, &c. were given, fell ill on the 33d day: he underwent a very powerful treatment, but ineffectually. "He was thrice copiouſly blooded; was plunged forcibly into the coldeſt water, for the ſpace of two hours, and was nearly drowned. He was clyſtered with effect. He himſelf forced down, with incredible averſion and labour, a great quantity of drink; by which he vomitted more than fifty times abundance of frothy ſlime. He took ſeveral ounces of oil, and ſeveral boluſes of caſtor and opium, of each four grains, without effect; and died the 4th day."

A girl, who uſed the muſk with cinnabar, was attacked with Hydrophobia on the 62d day, and died on the 65th. Her companion, a pregnant woman, had taken till this, the ſame medicine, which ſhe now exchanged for ſp. ſal ammon. Nothing farther being ſaid, it is preſumed that ſhe continued uninfected; but a third woman, who had taken nothing, fell ill on the 40th day. She is deſcribed, as ſuffering under the uſual ſymptoms, with the addition of excruciating pains in the bowels. She took, in two days, no leſs than two bottles of brandy, refuſing every other liquor. To this the doctor ordered daily two boluſes of caſtor and opium, and adviſed her likewiſe to add to her brandy an equal portion of oil. She recovered. This woman certainly never had the Hydrophobia. Apprehenſion of the fate of her companions, bitten at the ſame time, might have alarmed her.

The ſurvivors continued their prophylactic treatment to the 100th day. How far the remaining number would eſcape, could not then be known, becauſe the time of danger was not over. He mentions four of them who took nothing, being in as good health as any of thoſe under his care: and the concluſion from the whole is, that had his ſurviving patients taken nothing, they would have been equally in health.

5th. *By the Cold Bath, whether Salt or Freſh.*

Next comes the cold bath. From almoſt the earlieſt ages of medicine this has been practiſed, not only as preventative, but as a means of cure; and at this very day is uſed for both.[g] The limits preſcribed to theſe pages do not permit a minute diſcuſſion of this point, nor a formal refutation of every caſe brought in ſupport of this practice; but ſince it ſtill continues to be celebrated as a certain prophylactic, with a ſtring of reputed cures in proof, it becomes expedient ſlightly to touch on the ſubject. After maturely weighing all that has been adduced in its favour, my concluſion is, that it never at any time prevented the operation of rabid infection from coming into action at the time of its proper law, nor cured the diſeaſe when its deſtructive energy overwhelmed the ſyſtem. It is a ſimple corroborant; but the ſtrongeſt remedies of this claſs have never proved preventative where rabid virus has been received. Theſe, indeed, may be uſed; againſt them there lies no objection. They may prevent, provided the patient's ſtrong faith urges him to their trial, depreſſion of ſpirits, and the gloom that hovers over the mind from apprehenſion of the diſeaſe; but ſuch applications ought not ſolely to be relied on; if the malady is to be prevented, it muſt be by means ſuch as have lately been under conſideration.[h]

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[g] Several were bitten in Aug. 1794: they went to Brighton immediately after, to uſe the ſalt bath.

As to the preventative, cold water, reaſon can ſay nothing in this place for its virtues, whether it be ſimple, or impregnated with ſalt; whether it be in ponds near the patient's habitation, as adviſed by the antients, or in the ſea, as later authors have choſen to recommend. There are, I believe, only two ways in which ſalt water can act, either as a general corroborant, as juſt conſidered, or as a gentle purgative, from a ſmall quantity ſwallowed during immerſion; for ſudden immerſion, even almoſt to drowning, has been the common method uſed. Admitting then, though I believe it will not be granted, that much water enters the ſtomach during ſuffocation in this element, either partial or complete, that a ſufficient quantity has been ſwallowed to produce catharſis; what are our expectations? It may wipe ſome ſordes from the primæ viæ; it may cleanſe the alimentary canal; but purging will not kill the poiſon, nor eliminate it from the wound. Neither irritation, according to the pathology of ſome, as producing the diſeaſe, nor abſorption, as maintained by others, will be ſtopped in their progreſs by the operation of a purgative, nor the diſcharge of alvine feculencies.

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[h] Exciſion, &c.

Were I inclined to bring forward a numerous train of caſes of the failure of bathing, books would ſupply me; but one or two will prove the aſſertion as well as a thouſand. Mr. Nourſe's patient [i] (a lad bitten in the thumb) was ten times dipped in the ſea, took likewiſe Mead's ſpecific[k] for forty days. Was he cured? No; for he died hydrophobic nineteen months after; being in the interim cut for the ſtone and perfectly recovered from the operation. [l]

Celſus, I know, recommends it ſtrongly; not however as a prophylactic, but as a remedy for the removal of Hydrophobia itſelf. He obſerved the patient's inability to ſwallow liquids, and ſaw at the ſame time his great deſire for them. In order then, that his thirſt might be quenched, he directs the ſufferer to be thrown headlong,

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[i] Vid. Phil. Tranſ. No. 445.

[k] Pulv. Antilyſſ.

[l] Mayerne recommends bathing, and limits the number of dips to nine, imitating the Pythagorean numbers. It is ſcarcely neceſſary at preſent to mention this ſuperſtitious regard to the number nine.

and unexpectedly, into a fiſh pond, and ducked ſeveral times, that " his thirſt and dread of water might be cured together."[m]

It is needleſs to make any comments on this treatment. The reader will eaſily perceive it to be founded on miſtake. From this, however, the practice ſeems to have ſliden down to poſterity, and the original intention to have been miſtaken, as it was exchanged for one on no ſurer foundation, viz. that of a prophylactic.

We find, that in the days of Van Helmont, who lived ſo late as the ſixteenth century, that it was only uſed in the hydrophobic ſtate. This author relates, that he ſaw a patient ducked in this manner in the Netherlands, near Ghent, at a place called *Sluys*. Weights were tied to his feet, ſo that he could be kept under water, or hauled up by a rope faſtened under his arms, at pleaſure. He was thrice ducked; on the firſt immerſion he was ſuffered to remain under water *ad ſpatium miſerere*, which is about a minute and half: a ſufficient time to ſuffocate him, though not irrecoverably. On the ſecond and third he was allowed only to remain *ad ſpatium ſalutationis angelicæ*, i. e. about ten ſeconds.[n] This man was a cooper from Ghent. It is added, that he was cured by this treatment.

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[m] " Miſerrimum (Hydrophobia) genus morbi: in quo " ſimul æger et ſiti, et aquæ metu cruciatur. Quo op- " preſſis in anguſto ſpes eſt. Sed unicum tamen remedium " eſt, nec opinantem in piſcinam non ante ei proviſam pro- " jicere, et ſi natandi ſcientiam non habet, modo merſum " bibere pati, modo attollere; ſi habet interdum deprimere, " ut invitus quoque aquâ ſatietur. Sic enim, et ſitis et aquæ " metus tollitur." Celſ. de Medicin. l. 5, c. 27.

The caſe of a girl is related in the hiſtory of the Academy of Sciences at Paris, and ſaid there to be cured in the ſame manner; and a medical friend of mine is of opinion, that he ſaw a perſon prevented from Hydrophobia by the ſame means. Two were bitten; one uſed the ſea-bathing a conſiderable time, and eſcaped; the other did not bathe, and died. But it may be fairly concluded, that had the ſea bath never been uſed in this caſe, the perſon would have eſcaped, becauſe he was *not* infected; and had the other bathed, with all the diligence recommended, he would have died, becauſe he *was* infected: and this concluſion we draw from facts in ſimilar inſtances.

Morgagni mentions two caſes where death ſucceeded the cold bath: in the one, the patient died

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[n] If the firſt of theſe pſalms, viz. the 51ſt, be repeated in a diſtinct voice, and without rapidity, it will be found (meaſuring by a ſtop watch) to occupy about one minute and thirty-five ſeconds; and the ſecond about ten ſeconds.

died the night following; and in the other, a little after being taken out.

The child Jones was bitten in the autumn, 1796: he was immediately taken to the ſea coaſt and bathed; but it did not prevent the diſeaſe, to which about a month afterwards he fell a victim.[o]

Dr. Mead expreſſly tells us, that he knew many die raving mad who had undergone this treatment. Deſault ſaw ſeveral proofs of its inefficacy in one year. Four men were bitten by a mad wolf; two of them were dipped, yet died within the ſpace of one year. Choiſel gives his teſtimony againſt it; for he declares, "not one of thoſe who depended ſolely on this remedy ſurvived the bite more than thirty-three days." But why multiply examples? Theſe are ſufficient to condemn it. I ſhall reſt ſatisfied then with the mention only of one more; I mean the hydrophobic whoſe caſe is related by Dr. Munckley.[p] In the afternoon of the ſame day on which he was bitten, he went to the ſea: he ſtayed there ten days, during which he bathed conſtantly; yet, in the ſpace of about ſix weeks, he became hydrophobic, and died.

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[o] Vid. p. 119.

[p] Vid. Med. Tranſ.

The words of a medical philoſopher, high in the public eſteem, may be quoted on this occaſion. "I knew," ſays he, "where there were twenty-one people bitten by one dog. Nothing was done for any of them, and only one was taken ill. If they had all taken medicines then it would have been ſaid, that they only loſt one out of twenty-one."[q] Now had all theſe people bathed in the ſea, it would have had the reputation of a preventative in no leſs than twenty caſes out of twenty-one; ſufficient, ſurely, as it would ſeem to confirm its virtues.

As a ſpecies of bathing, it may be neceſſary to notice the ſhower bath. Boerhaave furniſhes us with an example of it: he poured buckets of cold water on his patient's head, and ſays, that by this means he brought him to ſwallow; but it proved equally futile with immerſion. He died ſoon after.

In the caſe laid before the public in 1791, by Dr Ferriar,[r] valuable both for the hiſtory, and the accurate anatomical examination, and the information conveyed, the Doctor gives it as his opinion, that the *cold bath*, with the free uſe of *bark* and *opium*, are ſtrongly indicated. He ſpeaks

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[q] Mr. Hunter's letter to the author.

[r] Vid. Med. Facts. vol. 1.

ſpeaks not, however, of its uſe as a prophylactic, but in the diſeaſe itſelf. The appearances of the inflammation, being of the eryſipelatous kind, warrant, he thinks, this concluſion.[a]

I muſt not, however, be underſtood as abſolutely rejecting the uſe of the cold bath immediately after ſuch accidents; but only in as far as it might lull into dangerous ſecurity the unfortunate perſon who might truſt to it from miſtaken principles, and from haſty recommendation, without, at the ſame time, purſuing other means more adapted for his real ſafety. Theſe have already been pointed out.

If, therefore, to the deſtruction of the bitten part, he adds the cold bath, I am far from diſcouraging him. It will tend, like every other general corroborant, to give greater firmneſs to the ſyſtem; and in this way, along with the ſatisfaction he receives from having complied with cuſtom, or the monitory injunctions of friendſhip, a degree of tranquillity may overſpread his mind as favourable to future health, as timidity and deſpondency might have been detrimental. But I repeat it, that the cold bath, in any form, cannot *alone* prevent Hydrophobia, where infection,

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[a] Vid. Hiſtory of the Diſſection.

fection, ſufficient to give it birth, has been received.

5th. *By Mercury.*

Several authors have inſiſted largely on the uſe of mercury in this diſeaſe, both as a prophylactic, and, like cold bathing, as a cure. Among theſe are James, Van Swieten, and Sauvages; and, later ſtill, de Laſſone,[t] with others. Dr. Cullen is likewiſe inclined to favour this practice, affirming its utility to be more ſupported by experience than moſt other medicines.[v] But we have no right to determine with certainty in its favour. On the contrary, it has failed in ſo many inſtances on record, where it was uſed even a conſiderable time, that we have great reaſon to ſuſpect its virtues, and might be juſtified in conſigning it to the ſame oblivion with other noted ſpecifics. De Laſſone affirms, that it was adminiſtered to eleven out of fifteen perſons who were bitten and torn by a mad wolf, on the 8th and 9th of December, 1775, within twenty-four hours of each other. Three of theſe, it ſeems, truſting to powdered oyſter-ſhells (a remedy, it is

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[t] Vid. Methode aprouveé pour le traitment de la Rage.

[v] Vid. Firſt Lines of the Practice of Phyſic. vol. 4.

is to be obſerved, ſomewhat ſimilar to our Ormſkirk) died raving mad. Alſo a fourth, a young woman, who did not apply for relief till two days before her death, and after Hydrophobia had commenced.

Blaiſe, a phyſician of Cluny, had the care of the remaining eleven.[w] They began a mercurial courſe. One man, after uſing it for ten days, became hydrophobic, and died forty-eight hours after: and, it is added, that he died placidly, and in his ſenſes. A ſecond uſed it near a month; then became affected, was furious, and died in two days comatoſe. A third (a boy) who uſed it for eighteen days, was then removed home by his friends, who ſuppoſed him ſafe, but who, three weeks afterwards, died. A fourth was diſcharged likewiſe, apparently well, after uſing the mercury a conſiderable time; but, ſix weeks after, he alſo became hydrophobic, and died. Here then are eight out of the fifteen loſt, four of whom were treated with mercury: the remaining ſeven have their cure attributed to it; but is it not as reaſonable to ſuppoſe them never infected?

If we draw a compariſon, it will be found, that a much larger proportion than ſeven out of fifteen, bitten by animals really mad, eſcape the infection. Dr. Vaughan relates, that between twenty and thirty were bitten, and only the one, whoſe caſe he lays before the public, was affected. And, " twenty-one were bitten," ſays Mr. Hunter, " by a mad dog; nothing was done for any of them; yet only one fell ill." This is, ſurely, a convincing proof of what we now advance. It is added, in Monſ. Blaiſe's account, in confirmation of its virtues, that all thoſe who recovered had uſed the mercury above a month. In the caſe of Abraham Palmer, who was bitten in 1783, we find mercury had a tolerable fair trial; but it was with equal bad ſucceſs.

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[w] Vid. Mem. de la Soc. Roy. de Med. Paris, 1783, part 2d.

Dr. Haulſton[x] gives an extract of a letter from a friend on the continent, wherein, among other information, an account is added of nine perſons, in the ſame priſon, bitten by the ſame dog, yet only one of them became hydrophobic: and it is affirmed by the bye, that he was neither the firſt nor the laſt bitten; nor yet the moſt wounded. He was under Dr. Haulſton's correſpondent's care, and died. Mercury was uſed in Maſter Rowley's caſe. " He alſo rubbed in mercurial ointment till his mouth was ſore;"[y] but with no better ſucceſs than thoſe we have pointed out.

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[x] Vid. Lond. Med. Journ. vol. 5, No. 4.

[y] Mr. Hunter's letter to the author.

Laſſone and Blaiſe extol mercury from a ſuppoſed ſucceſs in its exhibition; but they recommend at the ſame time a practice ſimilar to that which I am endeavouring to eſtabliſh. "It is moſt certain," ſays Laſſone, "that the remedies we have employed have been very ſucceſsful; (Is it becauſe ſeven out of fifteen eſcaped?) but they would have been much more ſo, had they been uſed early, and particularly if almoſt immediately after the bite, thoſe external means had been made uſe of, which appear to me indiſpenſably neceſſary, viz. deep ſcarifications, cutting away the lacerated parts, and thoſe adjoining to the wounds; the cautery; applying cupping glaſſes; and eſtabliſhing copious ſuppuration, for a long time, in the part." We have given ſeveral proofs poſitive of the failure of mercury, though it was diligently and properly applied; and one of theſe alone is of more weight in forming an opinion, than an hundred proofs preſumptive. It is needleſs to enquire who was the firſt propoſer of this remedy. We may only notice, that it appears to be of no very modern date. Among others we find Palmerius directing it to be applied to the wounds inflicted by a rabid animal; but it was in the form, and for the purpoſe only of an eſcharotic, viz. ſublimate and red precipitate, that the wound might be enlarged, and the diſcharge thereby increaſed.

Deſault afterwards advanced an opinion (for he did not endeavour to prove it) that canine madneſs was owing to minute vermicles; and as mercury was well known to be a powerful anthelmintic, he proceeded, on this ſuppoſition, to adminiſter this mineral;[z] and like others, who wiſh to celebrate and eſtabliſh their favourite ſpecific, he relates caſes of its ſucceſs, as he calls them. He alſo applied it in form of unction to the wounds. To this he joined the uſe of Palmerius's powder.[a] Though Van Swieten is inclined to ſpeak favourably of mercury, yet he is ingenuous enough to confeſs alſo its failure, and hints at a caſe in the Medical Eſſays, which we hold as a very convincing proof. For we are told of a youth bitten by a mad dog, who was then troubled with gonorrhœa, and who took at the ſame time his doſe of *mercurius dulcis*, and every following morning his purge; yet the frequent uſe of this medicine did not prevent him from periſhing; for a month after the wound was inflicted he died hydrophobic.[b]

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[z] Vid. Deſault Sur la Rage, 1734, 12mo.

[a] Vid. Appendix.

Dr. Dickſon likewiſe tried it without effect. In the beginning of January, 1767, John Brown, thirteen years of age, was immediately carried, after the bite of a mad dog, to the London Hoſpital. The parts affected were the right cheek and ſhoulder. Theſe were ſcarified, and allowed to bleed freely; then mercurial ointment was rubbed on them twice a day for ten days, without, however, producing ſoreneſs of the gums. Having no other complaints, he was diſmiſſed the hoſpital at the end of three weeks, and continued well for three months, when he ſuddenly felt a pain in the bitten part, and in a few days after died hydrophobic. It is argued by ſeveral who extol it, that though it has failed when the body was only ſaturated therewith, and without ſpitting; and this continued even for a long time; yet it is not ſufficient to condemn its uſe; for, if a ſalivation was raiſed, and continued for a ſufficient time, they are of opinion, that there is great reaſon to hope for ſucceſs. Cheyne held this opinion: "The cure cannot be certain," ſays he, "unleſs it be brought to riſe to a quick ſalivation." His reaſoning is as follows: "for, as the effect of this poiſon is quick, ſo muſt that be of its antidote."[c] Modern phyſiologiſts will ſcarcely acquieſce in this mode of reaſoning. The caſes quoted prove its failure; but by adding the following from authors of obſervation and experience, every doubt on the ſubject muſt vaniſh.

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[b] Vid. Med. Eſſays, Edinb. vol. 5, part 2, p. 590.

Etienne Champion was treated with mercury, and a ſtrong ſalivation produced.[d]

Briquet in vain uſed mercury three or four weeks to a ſalivation.[e]

The Sieur Gravan was ſalivated a conſiderable time, with the ſame unfortunate event.[f]

Meſſrs. Rebiere ſalivated no leſs than ten, and unſucceſsfully.[g]

M. Theiſſet treated ſeven hydrophobics with mercury, yet they all died.[h]

Dr. Oudot had a female patient who died alſo, though it was largely exhibited.[i]

Three of Laſſon's patients died, though treated in the ſame manner.[k]

A woman under Revolot's care uſed it unſucceſsfully.[l]

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[c] Vid. Diſeaſes of Body and Mind, p. 103.

[d] Vid. Appendix for Analyſis of Caſes from Mem. de la Soc. Roy. de Medicine, ann. 1783.

e, f, g, h, i, k, l, Ibid.

Dr. François had three patients to whom mercury was likewiſe ineffectually exhibited.[m]

Roux has collected ſeveral caſes to prove its inutility.[n]

To theſe I ſhall add only two more. In the one Dr. Gray of Bengal exhibited it, keeping up ptyaliſm a conſiderable time; and Dr. Raymond of Marſeilles in the other, uſed it for forty days, raiſing a ſalivation alſo; yet both theſe patients died hydrophobic.

Others, who praiſe this remedy, argue, with reſpect to its utility, on the grounds of analogy, between the increaſed flow of ſaliva occaſioned by mercury, and a ſimilar diſcharge in hydrophobia. It is ſuppoſed by them, that nature makes efforts to throw off the poiſon by theſe outlets; and aſſiſted by mercury, which exerts a peculiar power over theſe, there is a reaſon, they think, to hope for ſucceſs; yet experience does not confirm it. Let us remark, that in caſes of ſalivation from mercury, the parotid and other ſalivary glands are conſtantly affected; but in Hydrophobia this, I believe, does not take place. In one diſſection mentioned in theſe pages of an hydrophobic ſubject, the parotid glands were cut through, and no more marks of diſeaſe or redneſs diſcovered, than what might fairly be attributed to extravaſation from ſome ſmall veſſels opened by the knife. The fauces are not obſerved to be diſeaſed, nor any part of the mouth: great part at leaſt of the diſcharge appears to come from the ſtomach and œſophagus, by regurgitation into the mouth; and this may be noted as one of the peculiar and diſtinguiſhing marks of the malady.

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[m] Vid. Appendix for Analyſis of Caſes from Mem. de la Soc. Roy. de Medicine, ann. 1783.

[n] Ibid.

The obſervations of Dr. Ferriar coincide with my own on this remedy; and I adhere the more firmly to my former opinion, from its being corroborated by ſo judicious a phyſician. He reaſons on the dubiety of the practice in a ſimilar manner to what I had formerly done, and I find nothing now to make me relinquiſh it. "I own," ſays he, "I have ſome doubts reſpecting the propriety of uſing a remedy which produces ſo great a degree of irritation in the ſtate of high irritation attending Hydrophobia." But rubbing in ſtrong mercurial ointment in large quantities, has ſucceeded in removing tetanus, one ſymptom of which is *difficulty*, if not *impoſſibility* of ſwallowing; and thoſe who hold the connection of the two diſeaſes to be ſo intimate, as to conſider them almoſt one and the ſame, ſtrongly recommend it; but the analogy is greatly invalidated by its want of ſucceſs in every inſtance of its application in rabid Hydrophobia. It may be ſaid, that this applies more to the cure than prevention: it will apply to both.

Another argument for exhibiting mercury is built on the analogy of its *ſpecific* powers over the venereal diſeaſe, where the poiſon, like what we ſuppoſe in the rabid animals, is drank up, and carried into the habit by the lymphatics. But it does not follow, that becauſe it may be *ſpecific* over one ſort of poiſon, granting it unlimitedly this property, that it becomes ſo over others different in their nature, though entering the body by the ſame channels. The ſmall pox is an appoſite example. Mercury never killed variolous poiſon, nor prevented the appearance of the diſeaſe, when once the habit was tainted. This then is totally unequal to ſupport the cauſe for which it is produced. Beſides, we found the ſaturation of the body with mercury fail in Hydrophobia; but for the moſt part ſaturating the body with mercury cures the venereal diſeaſe, equally, if not with more certainty, then when ſalivation is raiſed; therefore, if it be ſpecific for killing the poiſon of a rabid animal, it ſhould prove effectual in this way as well as in the other. The arguments drawn from this ſource, I think, are not tenable.

Berkenhout, reflecting on what Deſault and Choiſel had ſaid relative to their ſuppoſed ſucceſs with mercury, imagines the prevention, granting this to have been the caſe, to be attributed to the fat in the unguent involving it (for unguent was always uſed in this form, as well as mercury adminiſtered internally). "For evidence," he ſays, "is wanting to prove, that the internal, without the external application of the ointment, will prevent the Hydrophobia. May we not therefore hazard a conjecture," he goes on, "that the lard or fat, of which the mercurial ointment is made, is the real preſervative?" Here he reaſons as if cures had been made by it. "Is not this powerfully ſupported," he continues, by the analogy between the canine poiſon and that of the viper, which is effectually deſtroyed by the viper's fat, or oil of any kind applied to the part." He acknowledges, however, that this is mere conjecture, to be determined by future experiments. That oleaginous ſubſtances do not prevent Hydrophobia appears from a failure in a late caſe, not to mention others on record, where the ointment had alſo a trial; for "he rubbed in mercurial ointment till his mouth was ſore;"[o] yet the diſeaſe, as the unhappy event proved, was neither protracted nor cured.

Dr. Houlſton, it is true, reaſons very ſpeciouſly for it. "Is the inference juſt, that becauſe the action of mercurials applied, for three or four days at moſt, will not cure the diſeaſe in its laſt haſty ſtage, the ſame remedy would have been of no avail in the interval between the bite and the attack? During that period a gradual and ſufficient action of the mercury might have been excited; whereas, when the Hydrophobia has appeared, there is ſcarcely ever time for ſuch effect."[p] The caſes we have already mentioned ſet this entirely aſide; but the following will illuſtrate it ſtill farther. The little girl that was bitten at Glaſgow, in 1792, was treated with mercury. Mr. Scruton ſupported a ſalivation for a week or two after the bite; yet it did not prevent the occurrence of the diſeaſe. She died on the 40th day after the accident. As far as mercury is an eſcharotic, the application of it to the wounds may be allowed; but its action is only as ſuch. An inſtance of the bad effects of the prevalent opinion, that mercury is prophy-

[o] Mr. Hunter's letter to the author.

[p] Vid. Mem. Comm. D. 1, vol. 8, p. 306.

prophylactic, may be adduced in the caſe of a perſon of my acquaintance. The dog that gave the wound was only ſuppoſed, but in reality was not rabid. Without waiting the conſequences, mercury was adviſed and purſued; and with ſuch rapidity, that a high degree of ſalivation, which could not be checked for a conſiderable time in a habit naturally irritable, and now under the influence of fear, followed its exhibition. A train of ſymptoms, induced by debility, rendered this unfortunate perſon long an object of commiſeration; and time and proper reſtoratives, long united, could with difficulty produce a perfect reſtoration.

I am inclined alſo to believe, that much miſchief has been done by the injudicious exhibition of this mineral, in every diſeaſe in which it has been uſed. How many ruined conſtitutions do we almoſt daily behold from the injudicious uſe of it for the cure of complaints proceeding from unclean embraces.[q] Few know its powers

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[q] Douglas wrote ſome obſervations on this ſubject in favour of mercury, ſupported by the following curious reaſoning, without attempting to produce a ſingle fact, viz. "It will evidently appear, by fair analogical reaſonings, and various experiments, that this antidote (mercury), which moſt effectually expels the malignant and deadly poiſon conveyed by *the ſting of a harlot's tail*, muſt alſo be the beſt antidote againſt

over the human body, compared to the numbers who raſhly undertake to preſcribe it. It requires nicety to diſtinguiſh how far we ſhould proceed in its exhibition, even in thoſe complaints where its uſe is plainly indicated, and where the cure may chiefly depend on it. All thoſe things denominated medicines are extraneous ſubſtances, i. e. foreign to the body; not being uſeful in ſupplying nouriſhment, or other deficiencies, from the waſte it undergoes; or, in other words, they are poisons of various degrees of ſtrength, according to their various natures; ſome of them highly deleterious, and ſpeedily and powerfully active. According then to their powers, and the particular habits they enter, their effects are exerted, always exciting inordinate commotions. To prevent however a greater evil, a leſs muſt be ſuſtained. Here is their utility, and here it ſhould ſtop. To overcome this evil, i. e. the diſeaſe, without injuring the conſtitution, and leaving other complaints as the conſequence of their exhibition, is the difficulty.

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againſt the ſting of the ſcorpion, the bite of the viper, rattle ſnake, and all the ſerpents in the Eaſt or Weſt Indies." We have refuſed already to admit reaſonings drawn from ſuch analogies. But mercury does not cure the bites of venemous ſerpents. He is right only in what reſpects the venereal diſeaſe.

6th. *By the Gaſtric Juice.*

The hint which Dr. Percival throws out, relative to the ſolvent powers of the gaſtric juice, is worthy of conſideration. I believe, with this venerable phyſician, that this animal fluid has a great power in rendering poiſons harmleſs; nay, perhaps, as he ſays, nutritious occaſionally. The poiſon of the ſmall pox, I think, has not infected the habit when taken into the ſtomach alone; but it is doubtful how far the ſeeds of ſeveral other diſeaſes would act on this organ if primarily affected by them. As another means of prevention, let it therefore be tried; but let it be in caſes only where material objections to exciſion ariſe from the local ſituation of the wound. Gaſtric juice can readily be procured at all times, and at all ſeaſons. We can, on the ſhorteſt notice, kill an animal for this purpoſe, or obtain the part we want (the ſtomach) from a neighbouring butcher. Should the carniverous be preferred to the graniverous animal, from a greater ſuppoſed activity in this liquor, cats, dogs, or crows are almoſt always in our power. But the author of this ſuggeſtion does not object to the ſaliva of a healthy young perſon: its virtues might ſtill be rendered more ſtrengthening and active, it is added, by uniting it with the gaſtric juice of a calf, "by chewing rennet well freed of its ſalt." But in the operation of freeing it from the ſalt, would not a conſiderable part of its virtues be loſt? "The ſpittle is demulcent, inviſcating, and capable of changing the qualities of bodies by its fermentative nature." Theſe are to be applied to the freſh wound, and renewed once or oftener in the day. The virtue of ſaliva applied to ſores, is well known to the common people in moſt countres, and practiſed by them. The faſting ſpittle, poſſeſſing, as they believe, ſuperior virtue, is uſed as a lotion; next ſome herb in repute (perhaps the plaintain) is well impregnated with ſaliva, by chewing it; with which, in form of poultice, they cover the ſores. Nor is it unfrequent even to employ the dog in their ſimple ſurgery, being perſuaded of ſome healing balſam adhering to his tongue.[r]

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[r] In other countries ſimilar virtues have been attributed to the dog's ſaliva. We find in the parable of Dives and Lazarus the notion to be common in Judea many centuries ago: and "moreover the dogs came and licked his ſores." In this leſſon, conveying uſeful and obvious morality, the dog is introduced ſupplying, by the balſamic ſaliva of his tongue, that curative relief which the rich man neglected to

With reſpect to preventatives, I have nothing new in this ſtage, as a remedy, to propoſe; no boaſted *ſpecific*, with which I would wiſh to amuſe the reader. Inſtead of this, my principle aim is to deſcry all *panaceas*, the *inanis jactantia multorum ſpecificorum*, as Boerhaave juſtly ſtiles them; and to turn the patient's attention to more rational prophylactics. If credulity can be removed, and one or more of the means propoſed be diligently executed, life may be preſerved, which evidently muſt be ſacrificed ſhould the empiric or the empiric's noſtrum continue to poſſeſs the patient's confidence.[s] To be ſenſible of our ignorance, to be convinced that we have hitherto acted wrong, is one ſtep towards acting right, and towards knowledge, ſince we then only turn our thoughts to another direction, in ſearch of what we want. He that can remove an error in ſo eſſential a point as what we have been conſidering, though he may not be able to ſupply a remedy, may be the indirect agent towards its accompliſhment, in as far as it opens a field for inveſtigators who may be more fortunate in their reſearches.

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to offer to the afflicted pauper at his gate. Vid. Saint Luke's Goſpel, chap. xvi. ver. 19.

[s] Vid. App. Fatal caſe near Yarmouth, in ſpring 1796.

Nothing is ſo fatal in medicine as blind ſecurity; nor ſhould we pronounce any ſpecies of diſeaſe incurable. All we have a right to ſay is, that we cannot accompliſh it: for though the preſent and antecedent ages have failed in finding a remedy, we act raſhly in concluding the ſame of ſucceeding generations. The mind is progreſſive, and the knowledge of one link in the great chain of cauſe and effect, ſerves as a key to the next; this again to another, &c. A diſeaſe may arrive to ſuch a point, that from viewing the ravages it has already made in various parts of the machine, and the comparative ſtrength of the whole, we may juſtly, and with little heſitation, conclude it incurable in that particular individual; but, at a certain time of the diſeaſe, our concluſions ought to have been very different. I am unwilling to call any diſeaſe, to which the human body is liable, not even Hydrophobia itſelf, abſolutely beyond the reach of medicine. This notion would increaſe indolence, and put a fatal ſtop to an induſtrious ſearch after knowledge. I may, however, give it as my own opinion, that no real caſe of Hydrophobia, well authenticated, has to this day ever been cured. I read of many cures, but I doubt their authenticity, i. e. I doubt whether the diſeaſe ariſing from the bite of a rabid animal really exiſted in thoſe perſons on whom the cures are ſaid to be performed. Imagination is powerful over the human frame; the mind, which operates on the body, may be equally elevated or depreſſed by it, according to exiſting circumſtances. This fact is well known, and needs no illuſtration. In applying this obſervation to our ſubject, we muſt recognize the dreadful effects of fear, as one of the moſt frequent cauſes introducing a diſeaſe ſo nearly reſembling the complaint under conſideration, that the diagnoſtic has eluded the ſearch of men of great medical ſagacity; and they frequently deſcribe diſeaſes as if they were rabidly hydrophobic, where the body was ſolely under the power of this paſſion. The limits I wiſh to preſcribe to theſe pages will not allow me to enter more minutely on the ſubject of ſpecifics; and nothing more, I preſume, is neceſſary on the head of preventatives. I ſhall proceed then to lay before the reader the leading ſymptoms characterizing the complaint in the human ſpecies.

SYMPTOMS OF THE DISEASE IN THE HUMAN SPECIES.

The diſeaſe which is the conſequence of the bite comes next to be conſidered. This need not be done at any great length, as almoſt every caſe forms a complete hiſtory.[t] Symptoms *merely* ſhall be enumerated.

All diſputes ſhall be paſſed over relative to the antiquity of the malady. It becomes of little real moment, whether Hydrophobia from rabid infection was obſerved in the days of Aſclepiades, as le Clerc alledges; or was known in the time of Homer, as Celius Aurelianus labours, by quotations from the Illiad, to prove.

In the courſe of the laſt *eight* or *nine* centuries ſeveral new diſeaſes have ariſen; and it is remarkable, that they are not only all infectious, but can be communicated by no other method than by infection, as far as our experience reaches. I do not mean by this to place Hydrophobia among diſeaſes of recent date, or only communicable by infection. There is ſome reaſon to conclude differently with reſpect to it. To doubt the infectious nature of the canine poiſon would be to doubt the cleareſt evidence, and hence it comes to paſs that it ariſes at all ſeaſons, and in every climate. When the malady manifeſts itſelf, the ſymptoms vary in various ſubjects, according to conſtitution, &c. but this is no more than what takes place in other diſeaſes. The pathognomonic and peculiar ſymptoms are but few.

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[t] Vid. Appendix.

The ſymptom Hydrophobia (dread of liquids) has been conſidered by ſome as its characteriſtic mark; by others denied; but as it is found in ſome diſeaſes, which cannot date their origin from rabid infection, Hydrophobia is not pathognomonic; yet the diſeaſe may ſtill retain the name as before, for difficult deglutition being preſent, leſs or more, almoſt in every caſe, the impropriety of the name is leſs.[v]

I firſt ſaw this diſeaſe when a boy, and though not then converſant with medical ſubjects, it arreſted my attention in a more than ordinary manner. The horrors, the tremours, the convulſions of the breaſt, throat, eyes, and the whole upper parts of the body, at the approach of the cup; the haſty manner its contents were thrown into the mouth, when the patient had reſolution enough to attempt to ſwallow; with the ſcene that immediately followed, made an impreſſion not to be effaced.

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[v] Exceptions are few.

Suppoſe then, what too often happens, that the patient has been neglected at the time of the bite, and during the interval between this and the diſeaſe, and confidence placed in ſuperſtitious incantations; an amulet, or ſome faſhionable prophylactic, and opportunities of applying efficacious means irrecoverably loſt, we ſhall find a malady about to commence little different from common diſeaſes. It firſt threatens by the uſual warnings of ſenſe of coldneſs, alternating with heat, pandiculation and yawning; and with ſometimes a higher degree of exhilaration of ſpirits.[w] Theſe being only the firſt harbingers, they continue ſometimes for three, four, and even to ſix or ſeven days before the patient takes the alarm: a ſeverer train of ſymptoms, but more characteriſtic, afterwards ſucceed.

SYMPTOMS.

1. The firſt is generally a pain in the part where the bite has been received, ſtretching upwards towards the hip and groin, if in the lower; towards the ſhoulder and axilla, if in the upper extremities; and ſometimes with diſcolouration: ſometimes to the temples, ear, and down to the throat, if about the face or neck. We have quoted examples to prove this.

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[w] Vid. App. Caſe by Dr. Girdleſtone. "He appeared uncommonly cheerful, diſtinct, and collected." Mr. Johnſton on Hogg's caſe.

2. Laſſitude, inactivity, and torpidneſs.

3. Diſturbed ſleep---watchfulneſs---*muſcæ volitantes.*[v]

4. Terrifying dreams----illuſions.[w]

5. Convulſions, eſpecially when offered drink.

6. Starting of the tendons.

7. Perpetual reſtleſſneſs.

8. Cannot bear a recumbent, eſpecially a ſupine[x] poſture.

9. Dejectedneſs and melancholy, with deep ſighing, fear, timidity, and apprehenſion.[y]

10. A deſire of ſolitude.

11. External organs of ſenſation morbidly acute, the ſmalleſt motion of the air, eſpecially cold air, producing great uneaſineſs.[z]

12.

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[v] "His attention was particularly directed to the flies; why dont you put away thoſe flies? he would cry, and kept ſtriking at them with his hand." Mr. Babington.

[w] "In the night ruſhing into his maſter's chamber, he declared there were thieves in the houſe, and that there were others endeavouring to ſteal horſes out of the ſtable; and pointed to lights, which he ſwore he ſaw paſſing to and fro, and deſcribing the dreſſes of the people." Dr. Shadwell. Vid. Mem. Lond. Med. Soc. vol. 3, p. 458.

[x] Vid. Dr. Vaughan, Caſe 1.

[y] "Whatever he wanted to obtain, whether to have ſome diſagreeable object removed, or ſome requeſt granted, it was implored in the moſt piteous manner. There was a fierceneſs diſplayed, with a mixture of timidity, that I deſpair of impreſſing the reader properly with." Dr. Vaughan.

[z] "The morning was cold, and he complained every now and then of the air ſuffocating him: he was therefore very intent upon mitigating its coldneſs, ere it was applied to the fauces,

12. The light offenſive to the ſight, and unable to look at a tranſparent body, ſuch as a mirror, a pool of water, &c.[a] unable alſo to bear the ſight of ſcarlet.

13. Eyes quick and penetrating.[b]

14. Great dilatation of the pupil; blindneſs, ſometimes temporary, ſometimes continual; and this either of one or both eyes.

15. Smell alſo diſeaſed.[c]

16. Tongue dry, and great thirſt.

ſauces, by holding a handkerchief conſtantly to his mouth." Dr. Vaughan. Cœlius Aurelianus notices the ſame.

This ſymptom is univerſal, though different in different patients: to all diſtreſſing. Some, to avoid the cold air, will walk; others even run backwards up a flight of ſtairs, with aſtoniſhing rapidity, rather than face the draught blowing down.

[a] "But a much greater inconvenience aroſe at the ſight of a puddle of water which frequently occurred in the ſtreets, through which he paſſed in going to the infirmary, and which never failed to produce a dreadful agony. He could look at his own urine in a dark-coloured chamber pot, but could not when put into a glaſs." Ditto.

[b] "The ſingular appearance of his eyes was very ſtriking, and is, I believe, peculiar to people labouring under the Hydrophobia. The iris had aſſumed an orange hue." Ditto.

[c] Nourſe complained of a fœtor in the wound: there was no diſcharge from it, and it was nearly cicatrized. This muſt have proceeded from his vitiated ſmell. "Even the ſenſe of ſmelling was preternaturally increaſed." Mr. Johnſton on Hogg's caſe.

17. Pulſe unſteady; weak; ſometimes hard, changing frequently.

18. Aſpect likewiſe various.[d]

19. Unuſual titilation of the urethra. Urine in ſmall quantity, ſometimes forcibly expelled by ſpaſms. After making water, *ſeminis emiſſio.*[e]

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[d] Dr. Fothergill.

[e] Both Mead and Liſter, as well as later authors, take notice of the *veretri frequens erectio cum ſeminis involuntario jactu*; as alſo Cœlius Aurelianus. Van Sweiten likewiſe relates more than one inſtance of it. Among others he mentions the caſe of a porter, as given by Hermandes in his Theſaurus, who breathed out his ſoul, as it is there expreſſed, for the laſt three days of his life, in this way; and in Bonetus's Sepulchra Anatomica, the caſe of an old man of ſeventy is mentioned, who from the priapiſm that attended the diſeaſe, was urged to converſe with his wife. It is obſerved however, that ſome of thoſe ſaid to be ſo affected, had large bliſters on them at the time; and it may in part, perhaps, be attributed to the irritation given by them: yet in ſeveral caſes related to me, this ſymptom did not occur. Vid. App. Caſe near Yarmouth, communicated by Dr. Girdleſtone.

Satyriaſis, as an original diſeaſe, has been accompanied with Hydrophobia. Vid. Mem. de la Soc. Roy. de Medicine. A curious diſpute was once agitated, as we find by a memoir inſerted in this work; whether a perſon bitten, and in the interval between this and the diſeaſe *ſi rem cum uxore habuerit*, infection would follow? The negative was proved by examples adduced. This unintereſting diſpute, neither very decent nor inſtructive, might have been ended without ſearch after inſtances to diſprove it; had the agitators reflected on the locality of the poiſon, on the abſence as yet of diſeaſe, and on the freedom of the fluids from taint.

20. Muſcles of the *gula* now convulſed, as ſoon as water or other liquids touch them, internally or externally.

21. Great ſenſe of ſuffocation, but ſeldom pain.

22. Stricture about the *cartilago enſiformis*.

23. Senſe of a boiling heat in the ſtomach.[f]

24. Strong palpitations of the heart.

25. In ſome inſtances the ſenſation of flame ſcorching the external body, eſpecially about the back and belly.[g]

26. Copious flow of ſaliva, viſcid and ropy.[h] Often exceſſive reachings to vomit; not in every caſe full vomitting.[i]

27.

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[f] Dr. Vaughan.

[g] Catherine Champion had the ſenſation of flames ſcorching her back and belly, and could not be perſuaded to the contrary; deſiring the phyſician to examine and be convinced of its truth. Vid. Mem. de la Soc. Roy. de Medicine. ann. 1783, p. 139.

[h] "His ſpitting of frothy matter increaſed ſo much, that in ſpite of all the care poſſible, his bed was exceedingly wetted by it." Vid. Lond. Med. Obſ. and Inq. p. 356.

[i] "My own patient, even under the large doſes of oil, never had the leaſt diſpoſition to vomit." Dr. Girdleſtone's letter to the author, Feb. 24, 1797.

"Reſpecting the ſtate of the ſtomach of Jeremiah Groves, while under Hydrophobia, as far as I recollect, there was neither ſickneſs nor vomitting during the whole courſe of the diſeaſe." Dr. Maclean's letter to the author. Jan. 26, 1798.

27. As the diſeaſe advances the ſpaſms of the cremaſter muſcle ceaſe. Eyes now loſe their penetrating appearance, becoming more fixed and heavy.

28. The diſeaſe ſtill advancing, pain from ſwallowing increaſes; and liquids in many, though not in every inſtance, totally refuſed.[k]

29. Pulſe intermits---hands and feet become cold.

30. The paroxyſms of the convulſions return now at ſhorter, but uncertain intervals--become more violent. *Riſus ſardonicus.*[l]

31. Now conſtant muttering and talking; yet when queſtions are aſked, rational anſwers given.[m]

32. Pulſe now more frequent; at length conſtant delirium, horror, and the extremeſt anxiety.

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[k] Vid. two caſes where liquids were not refuſed. Mem. de la Soc. Roy. de Medicine. ann. 1783.

[l] Dr. Vaughan.

[m] Dr. Wolf, of Warſaw, in deſcribing five hydrophobics to Henry Baker, F. R. S. gives the following picture. It is indeed melancholy in the extreme. "None of them quite loſt their right ſenſes; but they were all talking, without intermiſſion; praying, lamenting, deſpairing, curſing, ſighing, ſpitting a frothy ſaliva; ſcreeching, ſometimes belching; reaching, but rarely vomiting."

33. Frantic; and attempts, ſometimes in the fit, to bite; but this not frequent.[n]

34. Spaſmodic affections ſtill increaſing, ſometimes become ſo ſtrong as to throw the patient out of bed, if not forcibly held in it.

35. Death. This takes place variouſly; not unfrequently as if ſtrangled with a cord:[o] ſometimes placidly, and without the leaſt ſtruggle; and ſometimes even with a ſmile on the countenance.[p]

Dr. Liſter adds, in the hiſtory of a patient under the diſeaſe, "he had a violent fever on him." This was on the morning he died: but fever is not a common ſymptom, eſpecially in the early part of the complaint. In Maſter Rowley's caſe "conſiderable fever" was preſent: he complained greatly of a pain in his head, and of great thirſt: his pulſe was very quick, full, and hard. The wound became painful before the diſeaſe appeared: a pain in the right ear firſt announced indiſpoſition. This is a very early ſymptom, and it was therefore particularly marked out under the head of prevention, as a reaſon for preſuming the poiſon local till this time; and that exciſion might ſucceed if then performed.

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[n] "Upon my aſking him whether he had any propenſity to bite? he replied negatively, in a very plaintive tone." Dr. Vaughan.

[o] Race's ſenſe of ſuffocation increaſed as he came nearer his end. Vid. Appendix, vol. 2.

[p] "He fell back in the bed, and died with a countenance as much oppoſed to that of the minute before, as it is poſſible to conceive; the ſcene being cloſed with ſeveral of the moſt beautiful ſmiles." Mr. Babington on Palmer's caſe.

In the old woman's caſe, who died at Edinburgh, the firſt ſymptom was great pain in the cicatrix of the ſore, ſtretching up her arm. This was ſucceeded by ſhivering, followed by heat and thirſt, nauſea, and other febrile ſymptoms.

In Dr. Vaughan's firſt patient, a pain in the bitten part was the firſt ſymptom. In his ſecond caſe, a pain was likewiſe felt in the bitten part, which was the wriſt, extending up the arm, and even affecting the temple of that ſide of his head. In his third caſe, a boy eight years old, a pain in the bitten part, extending up the hand and arm, was alſo the firſt ſymptom.

In Dr. Berkenhout's patient a ſimilar pain in the bitten part preceded the diſeaſe. Dr. James notices the ſame occurrence. Cœlius Aurelianus alſo mentions it.

Two of the four perſons bitten by the mad wolf, as related by Deſault, had their cicatrices inflamed and painful, and hard about the baſe, riſing like embroidery, at the commencement of the diſeaſe.

In Knipe's caſe,[q] pain in the bitten part, extending up the hand and arm, was the firſt ſymptom. Morgagni, from the caſes he has collected, could not avoid noticing the ſame, and for this reaſon adviſes the exciſion of the cicatrix when it begins to itch, and pains to ſhoot from it, with change of colour in the part. Hence it is evident, that the re-inflammation of the wound is a common occurrence, and noted by moſt who had ſeen the diſeaſe.

It is curious to obſerve, that the muſcular ſtrength is little impaired in this malady,[r] nor do the lungs partake much of the diſeaſe. Patients can run, and are even relieved by this exerciſe, though violent. This, however, muſt not be denominated real ſtrength; it is the laſt exertions only of worn-out excitement; for debility and death ſoon follow.

It has been doubted by ſome, whether a great torpidity is not induced on the nerves, and muſcular coat of the ſtomach, by the rabid virus preventing ſtimulating ſubſtances from their uſual effects; and inſtances are adduced for the purpoſe of eſtabliſhing this fact. A caſe is brought forward of a patient, only eight years old, where ſo large a doſe as *two* grains of cupr. ammon. were adminiſtered not only without vomiting, but without the leaſt nauſea or ſickneſs; though this quantity, it is alledged, would have ſeverely vomited an adult, or a perſon in whom this organ ſuffered a leſs degree of irritation.[r]

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[q] Vid. Appendix, vol. 2.

[r] Vid. Tranſ. for Improv. of Med. and Surg. Knowl. Caſe of a boy running. Alſo Morgagni de cauſ. et ſedib. morb. Caſe of a boy at Bologna.

If the author had in view, as might probably be the caſe, Dr. Vaughan's patient, a child eight years old, the whole is not told: for the doctor added to the cupr. ammon. an equal quantity of extr. thebaic; and added alſo, in clyſter, a dram of the tinct. theb. with a view, no doubt, of preventing this effect. It was the virtues of ſtrong tonics in Hydrophobia, which he wiſhed to diſcover; and to prevent the ſtomach from rejecting the medicine, the opiate was conjoined.[s]

The following inſtances however, though a few only of what might have been collected, are ſufficient

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[r] Vid. Encyclop. edit. Edinb. Art. Hydrophobia.

[s] "Each doſe of his pills were directed to contain two grains of cupr. ammon. the ſame quantity of theban. extract, three grains of flor. zinc, with ten grains of aſafœtida; whilſt a ſolution of that fœtid gum, with a dram of tinct. thebaic, was adminiſtered as a clyſter. The above pills, though repeated every four hours, afforded not the ſmalleſt relief; nor did they ſhew the leaſt action upon the frame." Dr. Vaughan's 3d Caſe, page 33.

I find no other caſe recorded, where this medicine is given in the ſame quantity.

ſufficient to prove the irritability of this organ under the complaint, and the propriety of our noticing vomiting as a ſymptom.

1. Dr. Raymond's patient, Boyer, "vomited now and then, with violence, a glairy matter, little in quantity, and which made him ſhudder." This happened at Marſeilles.

2. The ſlave boy, attended by Dr. Gray, "had continual efforts to vomit, but without effect, from ten in the morning till four in the afternoon, when he died." This was in the Eaſt Indies

3. Dr. Shadwell's patient, Wyburn, "complained of a great ſtoppage in the throat, and load at his ſtomach; and ſaid he could vomit, if carried into the air." This was at Brentwood. This indeed is not abſolute vomiting, but ſufficiently proves the irritability of the ſtomach.

4. Race took medicines on the ſecond day of his illneſs, "and he kept them down but a ſhort time; for he had now a conſtant vomiting." Two days after this, having taken a powder in water, "he vomited it up ſoon after." This happened at Stowmarket.

5. The lad Brown, Dr. Dickſon's patient, "vomited frequently. Some hours before he complained of hunger, and ate an apple greedily,

dily, with a piece of bread and beef." This happened in the London Hoſpital.

6. Dr. Mead's firſt patient vomited on the ſecond day of his illneſs; "ate ſome bread and butter heartily, but vomited it immediately up again."

7. His ſecond patient "was vomited in the beginning." This was not ſpontaneous, but by medicine. But the author of an article in the Encyclopœdia would ſeem to inſinuate, that even emetics would ſcarcely induce this operation.

8. The girl Chriſtie "vomitted," and ſome time after this, a bolus was adminiſtered: "ſhe did not retain it." Two hours after another bolus was given, "but ſhe rejected it immediately:" two hours after, when another report was made, it ſtated, "has frequent reaching to vomit." About four hours after the clerk ſtates in a report then made; "conſtant vomiting." Another bolus was given; "it was vomited up the next moment." The ſame happened ſeveral hours after: "bolus rejected," which ſhe had ſwallowed with leſs entreaty than before. This happened in the Edinburgh Infirmary.

9. Maſter Rowley, whoſe death firſt induced me to undertake the arduous inveſtigation which I am now purſuing, was affected with the "ſame

ſymptom,"

ſymptom," not in the beginning, but in the progreſs of the diſeaſe. The phyſician had not left him an hour before he was taken with frequent "vomiting, reachings, and conſtantly ſpitting a viſcid phlegm. This came on before he took the turpith pills." Still farther in the progreſs, and near its determination, he is on the bed, "ſpeechleſs, groaning, foaming at the mouth, now and then vomiting a dark brown choler."

10. The boy, whoſe caſe is related by M. de la Pryme, "vomited a matter like black blood, which ſtunk like ſallad oil, but much worſe."

11. Mr. Bathie's patient, James Patton, "was *inclined* to vomit, but was afraid to do ſo for the obſtruction in his throat."

12. The lad, Palmer, was very irritable at ſtomach; for he vomited up the firſt bolus given him, ſoon after ſwallowing it. He vomited another bolus ſometime after. About two days afterwards, as the diſeaſe advanced, "he made frequent efforts to vomit." At another time opiate pills were given. "Theſe, however, ſtaid down but a ſhort time, and a ſecond and third which were given him came up almoſt inſtantaneouſly." Still nearer his end, attempting to ſwallow bread and butter, "it was thrown from his mouth, together with a quantity of glairy fluid he had been *vomiting* all the morning."

13. Dr. Vaughan's ſecond patient was ſeverely affected with irritability of ſtomach; for "in the evening he was ſeized with a vomiting, which continued the whole night, and until eleven o'clock the next day, every thing coming up as ſoon as taken."

14. Johnſon, Dr. Ferriar's patient, ſwallowed his medicines tolerably well; but as the diſeaſe advanced, in the doctor's preſence, "he reached ſeveral times, and threw off ſome wind. At a quarter paſt ten the ſame day, he ſwallowed ſome of his mixture, and immediately threw it up again."

15. Mr. Sabatier's patient, on the ſecond day after he was taken ill, "had a deſire to vomit."

16. Mary Strong, "a little before her death vomited about a pint of ſomething like blood coagulated." Had two grains of cupr. ammon. though mixed with opium, been given, it would appear from the irritability diſcoverable, that theſe patients would have all vomited from it.

17. The man who died in 1782, in the Middleſex Hoſpital, was affected with vomiting.

18. Gervais Briquet vomited in the beginning of the diſeaſe ſome black matter, with ſome wine he had taken juſt before. On the 10th day from the attack he vomited a large quantity of brown and black matter, which was thrown with ſuch

force, as to ſtrike the foot of the bed. Died an hour and half after.[t]

19. Catherine Champion alſo vomited.[u]

20. The Sieur Granan had nauſea, and an inclination to vomit, ejecting ſome glairy matter on the ſecond day of the diſeaſe; alſo continual efforts to vomit. During the ſame night diſcharged nearly a gallon of a thick glairy matter. It continued till twelve next day.[v]

21. The man-cook vomited the ſecond day of the diſeaſe. It returned alſo the ſucceeding evening, when he vomited throughout the whole night.[w]

22. Caſtinel vomited two days before his death.[x]

23. The advocate vomited a quantity of black blood.[y]

24. Another patient, mentioned in the ſame work, vomited the day before death.

25. Metzler was called to a hydrophobic, where conſtant vomiting for a conſiderable time took place.[a]

26. George Pollock, "immediately after drinking, ſweats about the head and breaſt, with vehement efforts to vomit. Three hours after,

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[t] Vid. Mem. de la Soc. Roy. de Medicine, ann. 1783.

u, v, w, x, y, z, a, Ibid.

convulſive motions, with deep ſighings; and after theſe reachings and vomiting." Thirteen hours after this. "Theſe efforts to drink always produce belchings and reachings to vomit."[b]

27. One of Dr. Wolf's patients, who had forced down a large quantity of drink, vomited more than fifty times in conſequence, ejecting by this operation an abundance of frothy ſlime.[c]

28. Nourſe's patient, Stephen Bellaſs, was affected with vomiting.

29. Francis Tweed vomited.

30. In Macey's caſe we find activity in ſtomach and in gaſtric juice; for a few minutes after he drank ſome milk, and but a few hours before his death, "it regurgitated in a ſtate of *partial* coagulation, and mixed with a fluid of a cineritious colour."[d]

From the hiſtory of the diſeaſe it is evident, that the ſymptom Hydrophobia is not the commencement, but rather a middle point in the malady. Being the moſt diſtreſſing, the previous ſmall deviations from health are often overlooked, and difficult deglutition firſt arreſts the attention, and creates the alarm. I would wiſh particularly to draw the medical reader's attention to this circumſtance; it will aſſiſt him in forming his prognoſtic; for after its appearance, not an inſtance is to be found of recovery; every paroxyſm collecting more ſtrength, death hurries on apace.

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[b] Vid. Mem. Lond. Med. Soc. vol. 1, p. 243.

[c] Vid. Encyclo. Brit. Edinb. vol. 11, p. 278.

[d] Mr. Haighton's caſe.

Authors, at an average, have placed this event about the fourth day; and it does not appear, from the following inſtances, that they were greatly miſtaken.

Mr. Bellamy became affected with the firſt ſymptoms, i. e. Hydrophobia, on the 13th, and died on the 17th.

Abraham Palmer felt ſome ſymptoms on the 17th, and died the third day after.

John Brown fell ill on the 30th of April, and died the fourth day after.

The gardener's ſervant continued well till the 28th of April, and died the 1ſt of May.

Mary Strong died four days after Hydrophobia appeared.

Maſter Rowley became affected on the 11th, and died on the 13th.

The French woman, bitten at the ſame time, was taken ill on the Friday, and died on Tueſday following.

Chriſtie came to the Edinburgh Infirmary under Hydrophobia. She died the ſecond day after.

Dr. Mead's firſt patient became hydrophobic the 22d, and died the 24th.

His ſecond became affected on the 8th, and died on the 11th.

His third continued three days from the time he was affected

Dr. Munckley's patient fell ill on the 19th, and died on the 21ſt.

The girl Niece died the third day from the commencement of Hydrophobia.

James Patten became affected on the 9th, and died on the 12th.

William Knipe became affected on Monday, and died on the Thurſday following.

Dr. Vaughan's firſt patient began to complain on Sunday, and the ſucceeding Wedneſday died.

His ſecond became affected on the 6th of June, and died in about 48 hours.

His third died four days after the firſt ſymptom.

Mr. Sabatier's patient, the gardener, died in two days from the commencement of Hydrophobia.

His ſecond patient died in 24 hours from the firſt attack.

Dr. Ferriar's patient continued to the 6th day.

Mr. Scruton's patient felt difficult deglutition on the 27th, and died on the 29th.

The old woman at Edinburgh, bitten in 1792, was ſeized on the 13th, and died on the 17th.

George Cobb died two days after Hydrophobia appeared.

John Slight died thirty-nine hours and a half after the firſt appearance of difficult deglutition.

Dr. Gray's patient died two days from the commencement of Hydrophobia.

Theſe inſtances may ſuffice to prove the rapid progreſs of death, from the commencement of Hydrophobia.

Obſervation has already taught us, in two caſes at leaſt,[d] that the diſeaſe in the dog occupies nearly the ſame period as in man.

A ſimilar relation is diſcovered in the diſtance intervening from the bite to the firſt ſymptom. Though three weeks be not a frequent interval in the human ſpecies, yet it is an occurrence happening in more than one or two ſolitary inſtances,[e] and this period is not unfrequent among the inferior tribes.

Dr. White mentions ſome animals bitten and infected, "which were all dead within the month."

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[d] Vid. p. 23. [e] Vid. Table of diſtance from bite, &c.

month."[f] A cow, ſome ſwine, and other animals, bitten by a mad fox, died in three weeks.

M. Bonel likewiſe mentions the death of five animals, viz. a dog, a cat, a bull, and two cows, none of which ſurvived more than three weeks from the bite. The cows lived after the commencement of the diſeaſe four days; the bull not quite ſo long; the dog three days, and the cat thirty hours.

Dr. Gutherie notices two dogs bitten at the ſame time with his patient, which died mad one month after.

A dog mentioned in this work, wormed when a puppy, contracted madneſs, and bit ſeveral dogs, two of which went mad about 20 days after.[g]

The puppy, whoſe caſe is deſcribed in page 23, died on the 21ſt day.

On the whole, however taking a number of caſes together, the diſeaſe will be found to appear earlier in the inferior order of animals, than in the human ſpecies; and a train of ſpaſmodic

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[f] Vid. Meaſe on Bite of Mad Dog. App. edit. Lond.

[g] Vid. Chapter on Worming, vol. 2.

ſymptoms mark the complaint in our domeſtic animals as well as in man.[h]

The dog bitten at the ſame time with Mr. Foot's patient[i] died on the 14th day after.

Dr. Weſtern mentions two ſheep, bitten in Jamaica, which were dead in ten days.

Col. Nixon relates an inſtance of a dog bitten in the Eaſt Indies, which died in ten days.

Mr. Meynell has obſerved the diſeaſe occur in fourteen days.

Dr. Shadwell noticed the appearance of the diſeaſe in a pig nine days after the bite.[k]

Dr. Dickſon takes notice of a dog bitten on the ſame day with his patient, which ſhewed ſigns of madneſs on the 7th.

Theſe inſtances, taken without ſelection, will ſerve as proofs of the above obſervation.

Though the diſeaſe cannot be marked by a ſtage commencing with a dread of water, a ſymptom which the dog does not diſcover, yet there is a period when he loſes his recollection, which diſtinguiſhes the boundary of a firſt from a ſecond ſtage. If he is chained, his howlings are of the moſt melancholy and diſtreſſing kind, far different from the fretful barking of a confined dog in health. About two days of howling and fury generally terminate the ſcene.

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[h] Dr. Shadwell relates a wonderful inſtance of ſpaſmodic affections in a pig under the diſeaſe. It leaped from the ground to the height of 12 feet. Vid. Mem. Lond. Med. Soc. vol. 3.

[i] Vid. Med. Facts, vol. 3, p. 33.

[k] Vid. Mem. Lond. Med. Soc. vol. 3.

With reſpect to the diſeaſe in the human ſubject, difficult deglutition marks the commencement of the ſecond ſtage. After this has taken place no human means have been able to ſave life. Medicines cannot, in many caſes, be at all ſwallowed: in thoſe where the efforts of the patient have prevailed, and they have reached the ſtomach, they are either rejected, as we have ſeen, by vomiting, or become ineffectual from the power of the virus over that organ.

The gradual approach of the firſt ſtage towards the ſecond, affords a better opportunity of trying the effects of medicines. This moſt important period is however unfortunately neglected; its warnings are either taken for a common cold, or ſome more trivial complaint: even Hydrophobia at firſt is conſidered as ſuch, and for a day or ſo the patient is willing to indulge himſelf with this hope. But viewing the diſeaſe as above, the firſt approaches muſt be narrowly watched, if expectations of ſucceſs are to be entertained. This is the moment which is precious;

cious; this is the time the phyſician muſt apply with all his energy, and with all his judgement his remedies.

In order to arrive at a better knowledge of the pathology, and a better explanation of ſeveral phenomena in the hiſtory of the diſeaſe, it will be proper to lay before the reader a few of the particulars which Diſſection has enabled us to diſcover.

DISSECTIONS.

DISSECTIONS.

BEFORE our own times I find no examination of human ſubjects periſhing under this malady. Morgagni ſays, that prior to him there had been none attempted, except one by Cappivacci, his countryman. This muſt, doubtleſs, have ariſen from the dread entertained of the infectious nature of the diſeaſe. It was univerſally believed, that man infected man, and that animals, of whatever ſpecies, infected animals of every ſpecies.

Stalpart had his mind ſo impreſſed with the poſſibility of man's communicating the diſeaſe, that in the inſtances where he had occaſion to feel an hydrophobic's pulſe, he immediately after waſhed his hands.

Themiſon likewiſe, under the ſame impulſe, thought himſelf infected after viſiting a patient under Hydrophobia. He imagined his deglutition already impeded. He recovered from this dread, and aſſerted he had accompliſhed a cure on himſelf.

During the prevalence of theſe opinions, we need not wonder if attempts towards an inveſtigation of hydrophobic cadavera ſhould be made with caution and irreſolution when made at all. Hence the diſſections, few as they are, exhibit ſuch unſatisfactory marks. Appearances viewed in haſte, and with trepidation, cannot be deſcribed with accuracy: examinations are generally undertaken alſo at too great a diſtance from death to diſcover the real effects of the diſeaſe.

If the human ſpecies be incapable of communicating the diſeaſe when alive, and little doubt remains of this fact,[k] the terror of inſpecting the bodies of hydrophobics muſt vaniſh. An inſtance or two has been mentioned of a ſmall ſcratch or abraſion of cuticle ſpeedily becoming inflamed and feſtering after diſſection; and the pain has been ſpoken of as extremely acute, alarming the operator, but no ſerious evil followed. Provided however, it had been otherwiſe, Hydrophobia would not have been the complaint, but in all probability a putrid diſeaſe. Fevers have ariſen from proſecuting diſſections, ſpeedily inducing death.

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[k] Vid. vol. 2, under the head Hydrophobia, not Madneſs.

From what has been ſaid we may look in vain for accuracy among the generality of diſſections recorded by authors. They preſent indeed many deviations from the ſound ſubject; but in a diſeaſe where convulſions form ſo characteriſtic a part, the injuries ſuſtained muſt be in proportion.

Morgagni details only a few diſſections, but enumerates a conſiderable number. He was a man of great reading, and a ſkilful anatomiſt; yet in the only two caſes where an opportunity was offered him of inſtructing mankind, by his own examination, his private affairs deprived the world of his labours, and they were entruſted to his friend Mediavia. In collecting diſſections he found a variety of appearances deſcribed, and no two caſes were the ſame. He declines, therefore, drawing concluſions concerning the ſeat of the diſeaſe. Speedy putrefaction, however, ſeemed common to all.

He mentions one made 24 hours after death:[1] it was indeed in the hotteſt ſeaſon of the year. The neck was tinged with a livid colour, though the reſt of the body did not ſmell greatly. In this example the veſſels of the ſtomach were as much diſtended with blood, as if injected: it con-

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[1] Vid. Morgagni, Epiſt. 8, 26.

contained a fluid of a yellow greeniſh colour. A conſiderable part of the liver was livid; the gall bladder full of bile of a brown colour. Some marks of inflammation were obſervable on the diaphragm. The lungs extremely turgid with blood; ſwelled, but not hard, and of a black appearance. The blood throughout the body congealed, black, but not of a firm conſiſtence. The top of the œſophagus, as well as the pharynx to which it was connected, was of a blackiſh red colour, tending to a gangrene, as were the larynx and aſpera arteria; but no mark of diſeaſe appeared in the lower part of the œſophagus connected with the ſtomach. A green and yellowiſh foam ſtuffed the pharynx, the poſterior opening of the noſe, and thickly covered the roof of the mouth.

The blood veſſels running through the meninges of the brain, much diſtended: the ſubſtance of the brain itſelf every where diſtinguiſhed by bloody points, and a kind of bloody filaments. The lateral ventricles contained a ſmall quantity of reddiſh ſerum. It is added, that this man was delirious; kept continually crying out, and laboured at the ſame time under fever.

Another patient was opened 16 hours from death;[m] and though in a cold time of the year for that climate, yet the body was in a putrid condition, and ſmelt ſo offenſively, that they were obliged to ſeparate the head and thoracic viſcera, and inſpect them in the open air.

The lungs were black, and ſmelt ſtrongly. The right auricle of the heart was greatly dilated, not from the blood it contained, but from air: the left much contracted; and in the ventricles were thin polypous concretions.

The veſſels of the dura mater contained ſimilar concretions, but of a looſe conſiſtence. Some bubbles of air were obſerved under this membrane. The veſſels of the brain were every where diſtended with blood; and the choroid plexus ſo full, that it appeared black, without extravaſation of ſerum.

The ſubſtances of the cerebrum and cerebellum were rather dry than moiſt. The putrefaction prevented the inſpection from being farther carried on. They obſerved in general, however, that the blood was rather concreted than diſſolved. The material parts, i. e. the œſophagus and ſtomach, were left unexamined; and the diſſection without them proves of little uſe.

They

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[m] Vid. Morgagni, Epiſt. 8, 23.

They ſhow indeed marks of previous derangement, but whether to be attributed to the agitation of mind, the concomitant convulſions, or mode of treatment, or to the whole combined, is a queſtion.

This patient was bitten ſome months before, and during the diſeaſe was perfectly rational. He was very roughly treated, both by the pouring of water in abundance on his head, and then forcibly plunging him into the cold bath, where he was held till, as it is ſaid, he drank water, but rather till he was nearly drowned. He lived about a day after. The reader may eaſily ſuppoſe, that the means uſed for his relief, greatly agitated his body, changed the mode of circulation, and induced part at leaſt of the appearances, both of the brain and lungs. He mentions a woman likewiſe, whoſe body was entirely putrid within 15 hours after death, and this even in the middle of winter.[n]

Morando Morandi[o] found the ſtomach and inteſtines, in two caſes "affected with a gangrene, and daubed over with a black and fœtid bile."

Senac ſaw the "pericardium ſo conſtricted and annexed to the ſurface of the heart, in a man who died of dog-madneſs, that it could not be ſeparated therefrom."[p]

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[n] Vid. Morgagni, Epiſt. 8, 31.

[o] Ibid, Epiſt. 61, 9.

Zwingerus[q] aſſures us of the blood being concreted in the heart and large veſſels, and that the inteſtines moreover, but eſpecially the ſtomach, were diſtinguiſhed with red ſpots.

Brechtfeld obſerves of a diſſection which he is deſcribing, that "the right auricle of the heart was amazingly ſwelled: the right ventricle was full of grumous blood, and in the left was a blood altogether fluid."

Without knowing more of the caſe than this obſervation contains, our concluſions muſt be imperfect. Taking it as here preſented putrefaction is proved.

In the caſe of a man of ſixty, deſcribed by Morgagni,[r] the appearances were: 1ſt. Inteſtines much diſtended with air, but otherwiſe nearly empty. 2nd. The ſtomach contained a ſmall quantity of an aſh-coloured thickiſh, not viſcid fluid. 3d. The gall bladder contained a ſmall quantity of highly yellow bile, by which the duodenum, and contiguous portion of the liver were ſtained. 4th. "The iliac veins were ſo turgid with blood, that they equalled the natural diameter of a ſmall inteſtine; but their correſponding arteries were utterly empty." 5th. The lungs were ſtuffed with blood, as if the craſſamentum of the whole blood of the body had been collected there. The back part might be pronounced in a ſtate of gangrene. 6th. The pericardium contained about three ounces of a yellowiſh fluid. 7th. The heart contained a ſmall quantity of blood reſembling half-melted pitch. 8th. The vena azygos contained a very ſmall portion of blood. 9th. The internal carotid arteries and jugular veins were entirely empty. 10th. The organs of deglutition were free from inflammation, except a ſlight redneſs on the top of the pharynx; but the membrane ſurrounding the epiglottis was ſhrivelled and criſp. 11th. The veſſels of the meninges were greatly diſtended with black blood. 12th. The optic nerves were more than uſually flaccid, and ſomewhat thickened. 13th. The cerebrum and cerebellum appeared healthy. 14th. The ventricles of the brain contained about three ounces of a yellowiſh fluid. 15th. The thoracic and abdominal viſcera were unchanged.

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[p] Vid. Morgagni, Epiſt. 61. 9.

[q] Ibid, Epiſt. 8, 20.

[r] Ibid, Epiſt. 8, 27.

It appears doubtful whether this was a caſe of rabid Hydrophobia. The man indeed was bitten about three months before by a rabid animal; but about twenty days preceding his death he was thrown into violent agitation by a threatened beating. Till then he was in perfect health; but from this till the time he entered the hoſpital with difficult deglutition and dread of water, only two days before his death, he became uncommonly fearful and timid; ſhunning every one, and hiding himſelf whenever he could from notice. If it is to be termed Hydrophobia, it belongs to the ſpontaneous, not to the inoculated ſpecies. We have no caſe of the latter, where twenty days intervene from the firſt appearance till death. When it is compared with ſome which ſhall be mentioned as ſpontaneous, the ſimilitude will be found nearly exact.

This patient is repreſented to be of a choleric and ſanguineous, though robuſt habit. All the appearances preſented in the diſſection proved great derangement of the functions, and irregularity in the diſtribution of the fluids. A dropſy both of the brain and pericardium was preſent. The caſe reſembled, on the whole, Boerhaave's idea of Hydrophobia, *morbus ſummè inflammatorius.* The ſalival diſcharge was neither ropy, nor in great quantity. He ſpat often, it is obſerved; but the ſpittle was fluid. He had no foam about his mouth.

To conſtitute a rabid diſeaſe it is not ſufficient that the complaint ſhould ariſe within the limited time preſcribed to rabid infection; for infection might not have followed *that* bite. The diſeaſe muſt have all the intrinſic marks to conſtitute it of the rabid claſs: inflammatory ſymptoms do not belong to it.

Morgagni obſerves of the caſes then under his conſideration, that "as there are many things in which theſe patients while living differ one from the other; ſo there are not fewer, but even more, in which their bodies differ after death." To demonſtrate this he brings together a great variety of morbid appearances obſerved in the different parts, claſſing them under diſtinct heads, beginning externally and proceeding to the internal organs.

It is by no means clear, that in this large collection of diſſections the patients were all affected with rabid Hydrophobia. Marks of putrefaction were very evident in many of them, both on the external, and in the internal parts. In three caſes the lividneſs on the external body was almoſt univerſal. It was diſcoverable on the neck, ſhoulders, back, and fingers. The ſtomach was found, in another caſe, diſtended with air, and its veſſels turgid with blood. In another its internal coat corrupted (perhaps ulcered or ſphacelated) and in others again dotted with red ſpots. The inteſtines were, in three inſtances, diſtended with air; and in a fourth ſprinkled with red ſpots, diſtinct from each other.

He mentions ten inſtances in this recapitulation, where the lungs were ſtuffed with blood, ſometimes black, and always with marks of inflammation. Whether they were hydrophobics contracted from rabies, the reader, on comparing the originals, muſt judge. He collected his obſervations with great induſtry, yet delivered for the moſt part

"The total griſt, unſifted, huſks and all."[s]

He judged, doubtleſs, this the ſafeſt method, as it left the mind at liberty to adopt or reject, according to the point of view in which they were ſeen. He likewiſe entertained the notion prevalent not only in his days, but with the antients, and with many even at preſent, of the poſſibility of the diſeaſe remaining latent for twenty, forty, or even a greater number of years, and then appearing. This would lead him from the conſideration of diſtinction of hydrophobic and tetanic affections; preſuming when the complaint aroſe, that it muſt proceed from the bite, if any could be traced, how diſtant ſoever it had been received.

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[s] Cowper.

In five inſtances of diſeaſed pericardium, one was dropſical; two with no fluid whatever; another with a very little only; and the laſt in a great degree dry and friable.

In ſeveral inſtances of diſeaſed heart, the appearances were likewiſe various: now the cavities were extended with air; now contracted and dry: now flaccid, ſometimes with ſmall polypi: once diſtended with blood, as we have ſeen like melted pitch; and one where the right ventricle was full of grumous blood, while the left contained it altogether fluid.

The œſophagus likewiſe, in different caſes, preſents different appearances. Here it is marked with ſome inflammation; there no morbid appearance is diſcoverable.

The ſame variety was found in comparing the brain in different caſes; but the reader is referred to the work itſelf.[t]

Dr. James does not give his remarks on the affection of the ſtomach from his own obſervation; his authority is nothing more, therefore, than a re-echo from others. He likewiſe notices the offenſiveneſs of the matter vomited by hydrophobics, which would ſeem to imply diſeaſe of the ſtomach.

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[t] Vid. Morgagni, Epiſt. 8.

Dr. Mead relates three caſes of Hydrophobia; and in one of them, which was opened twenty hours after death, he adds "We examined the brain, throat, breaſt, and ſtomach; but met with no extraordinary appearance any where, excepting that there was a great quantity of greeniſh viſcid bile in the ſtomach." This is the whole account given.

The third caſe, ſent him from Stamford, has the following particulars: Fauces much inflamed; left lobe of the lungs black, with the veſicles full of black blood; bliſters appeared in ſome parts of them, as if raiſed with cantharides. The liver was hard, and of a yellow bilious colour.

Dr. Vaughan was permitted to open two of the three patients whom he attended. In the firſt nothing preternatural was obſervable, either in the ſtomach or œſophagus; nor in the contents of the abdomen, which could lead to any concluſions reſpecting the nature of the diſeaſe: neither did the ſecond ſhow any morbid appearance.

Gallet Dupleſſis[u] relates the diſſection of a hydrophobic; but it appears not to have been made with much accuracy, as the ſtomach is left unnoticed.

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[u] Vid. Mem. de la Soc. Roy. de Med. ann. 1783, part 2.

noticed. The condition of the heart indeed points out diſeaſe: the left ſide of this organ was ſhrunk and ſoft; and the auricle contained black and grumous blood. The other ſide was in its natural ſtate.

Dr. Mignot de Genety[v] inſpected a caſe, wherein he found ſome inflammation of the trachea. Marks of diſeaſe appeared in the inteſtines and ſtomach, where a number of lumbrici were diſcovered.

Briquet was opened; but not till three days after death.[w] Appearances at ſo late an examination cannot be depended on; they teach nothing.

Catherine Champion was alſo opened.[x] Here the ſtomach preſented diſtinct dots; and the inner coat was numerouſly ſprinkled with them near the fundus of the great curvature; while ſome of a ſmaller kind were obſerved in the inteſtines. Some turgeſcence appeared in the blood veſſels of the brain; but the ventricles were free from water.

Sieur Gravan was examined ſixteen hours after death. The ſtomach was found ſimilarly dotted with red ſpots. Near the pylorus it was ſoft, as if macerated, and this approach towards ſphacelation was more diſtinct in the duodenum. The aorta in this caſe contained a very large quantity of blood, nearly fluid, and of a black colour. The venous blood was of the ſame quality. On opening the head, the blood veſſels appeared turgid, eſpecially in the longitudinal ſinus. A conſiderable quantity of water was found in the ventricles.

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[v] Vid. Mem. de la Soc. Roy. de Med. ann. 1783, part 2.

[w], [x], Ibid.

Whether this dropſy of the head was in conſequence of the convulſions, or of the poiſon, I ſhall leave to others to determine. In the pericardium no ſerum. The right lung was found ſomewhat ſhrunk; but no inflammation was diſcoverable either in the larynx, pharynx, or œſophagus.

In Dr. Benſell's patient (the girl Niece) a diſeaſe of the ſtomach would ſeem to have been indicated by the matter thrown up. Little vomiting indeed appeared in this caſe; but that little, it is added, was *tinged* with blood. The quantity of ſaliva was but trifling in the firſt period of her illneſs, but it increaſed as the diſeaſe advanced. It ſeemed indeed to be phlegm collected deep in the throat, and the conſequence of ſecretions in theſe parts.

One of the moſt inſtructive diſſections with which the public has yet been preſented, was made by Dr. Ferriar, in 1791.[y] The principal appearances are as follow: They confirm ſome of the preceding obſervations. The inflammation in the ſtomach has been ſuppoſed to ariſe from the action of the gaſtric juice. I would refer it, however, ſolely to the action of the poiſon.

Brain----A preternatural diſtention of the pia mater in both hemiſpheres, with a limpid fluid. The quantity of water in the lateral ventricles of the baſis of the brain, and round the ſpinal marrow, ſomewhat unuſual.

Lungs----Sound, excepting one ſlight adheſion at the poſterior part of the left lobe.

Trachea----This was perfectly ſound.

Pericardium----This adhered pretty firmly to the heart in its whole compaſs.

No external marks of diſeaſe on the ſtomach or inteſtines; but on opening the œſophagus, a morbid appearance preſented.

The epidermis of the œſophagus, about two inches above the cardia, was abraded in irregular points, and an inflamed ſurface of a darker colour appeared. Lower down the abraſions became linear, and extended into the ſtomach itſelf.

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[y] Vid. Medical Facts, Vol. 1.

The edges of the epidermis ſurrounding the abraſions, were unequal and elevated. This appearance could be traced along the upper curvature of the ſtomach, becoming fainter as it approached the pylorus, about which it ſeemed to terminate.

The whole inflamed parts bore a ſtriated appearance, darkeſt at the œſophagus, and lighteſt and leſs diſtinct towards the pylorus. The ſtomach was half full of a dark-coloured fluid, ſmelling ſtrongly of muſk; a medicine which had been adminiſtered. It is remarkable, that this patient ſwallowed, with tolerable facility, the liquids preſented ſome time before death.

All the other viſcera were ſound. This inſpection was made only four hours and a half after death. Hence the abraſions, as the doctor ſays, may be fairly attributed to the diſeaſe. This will account for the irritability of the throat, and its ſenſibility to cold air, cold water, and to liquids in general; for the dread of water is nothing more than the ſymptom.

Here we may ſuppoſe accuracy of examination, made at a period ſo near death, that all ſuſpicion of change from putrefaction muſt be removed. A number of diſſections were communicated ſome years ago to a ſociety,[z] whoſe object was the inveſtigation of this diſeaſe. They have not thought proper, however, to detail them; but contented themſelves by merely giving the reſult in this obſervation: "An appearance has in general been ſeen on the inner coats of the ſtomach, near the cardia, ſimilar to what is found in the bodies of perſons who have had ſlight inflammation, that is, a greater number of red veſſels, with ſmall ſtrakes of red blood." They obſerve likewiſe, a ſlight watery effuſion on the ſurface of the brain, with ſome increaſe of vaſcularity in the pia mater.

An account of the inſpection of ſome dogs dead of the diſeaſe, was likewiſe added, and the ſame abraſions of ſurface in the form of linear points were detected in the œſophagus and ſtomach. From this we may conclude, that theſe are peculiar to animals, of whatever ſpecies, dying of this affection; and that the exceptions noticed by Morgagni, Vaughan, and ſome others, are too few to deſtroy the force of this general obſervation.

Inattention may have overlooked them in ſome inſtances, and in others, where more accuracy was uſed, the change of appearance by the diſtance from death, before the inveſtigation was begun, will account for their being ſeldomer noticed. If however we view theſe anatomical obſervations in a maſs, an explanation will preſent itſelf of that diſtreſſing ſymptom common to every caſe, pain, and undeſcribable uneaſineſs about the præcordia. The diſeaſed condition however of the blood, as viewed after death, is far different from what it preſents during the diſeaſe, when taken from the arm. In this ſtate authors conſtantly ſpeak of it as healthy. I recollect but one obſervation in a large collection of examples to the contrary, and in this the blood is only remarked to flow from the vein "very thick and black."[a]

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[z] Vid. Tranſ. of a Soc. for the Impr. of Med. and Chirurgical Knowledge.

The diſſection which we have lately been conſidering preſents no diſeaſe of the pulmonary ſyſtem; for the ſlight adheſion in part of the left lobe could only be accidental, ariſing moſt probably from a previous catarrh. This would ſeem to confirm the obſervation formerly made reſpecting the freedom of this organ from diſeaſe in Hydrophobia; but moſt of the inſtances enumerated in the above collection, point out the reverſe. This cannot be reconciled otherwiſe than

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[a] Mead.

than by preſuming a want of diſtinction of real caſes, and attributing, at leaſt in part, to this, what belongs to other complaints.

I ſhall reſerve the inſertion of ſeveral diſſections to a future part of this work.[b] What will be found there do not however differ in many reſpects from theſe juſt conſidered. Putrefaction we find is fully eſtabliſhed as an early occurrence in hydrophobic cadavera; but the appearances preſented go ſomewhat farther; they eſtabliſh likewiſe a high degree of debility antecedent to death. In moſt caſes the heart points out irregularity in its action, neither ſyſtole nor diaſtole, being ſynchronous. One ventricle is contracted, the other at the ſame time dilated: again, one is ſtuffed with blood, and again dilated and ſtuffed, if I may ſo ſpeak, with air only, i. e. dilated without blood. The great arteries and veins in their union with the heart, ſuffer the ſame irregular motion.[c] Here are evidences of powerful ſpaſmodic action which this muſcle undergoes.

We cannot wonder if the diſtribution of the blood be equally irregular, and the circulation ſtopped in one part, while this vital fluid is hurried on with celerity, and accumulated in another, whence, by exiſting contractions in the courſe of the veſſels, it cannot return to its origin in its uſual uniform and uninterrupted way.

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[b] Vid. App. vol. 2.

[c] Vid. App. vol. 2. Caſe of Middleſex Hoſpital, as one proof. Morgagni and other authors afford more.

To debility therefore may be aſcribed all the various phenomena obſervable both in the living and the dead ſubject; while the variety in conſtitution, ſtrength, ſex, and age, will influence its degree, and the degree of irregularity in the functions of the individual. To remove the impediment from circulation, and reſtore the heart to its wonted energy, are *deſiderata* of the higheſt importance. It is not the anxiety alone in the epigaſtric region, nor oppreſſion at the cartilago enſiformis, a ſymptom ſo diſtreſſing in every caſe, which will thereby experience relief; but the ſtate of the brain, the inordinate action and irregularity in the functions of this organ, cauſing occaſional fits of fury, the preternatural ſenſibility of the optic nerves, the diſeaſed ſenſibility diffuſed over the ſurface, and other diſtreſſing ſymptoms; even Hydrophobia itſelf, with all the deliria of wild illuſion, muſt equally diſappear.

Much remains to be diſcovered before we arrive at a knowledge of all the phenomena of this malady; but perſeverance will accompliſh much, and I deſpair not of the treatment being as well underſtood ſome time hence, as the treatment of the ſmall pox. If no diſſections were made till the preſent century, and if, till lately, miſtaken notions of the infectious nature of the complaint in the human ſpecies were entertained, it cannot be ſurprizing, that anatomy has given ſo little ſatisfaction. In a few years, I truſt, this defect will be ſupplied, and a better pathology be afforded.

Alluſions having been made to another ſpecies of Hydrophobia, not ariſing from rabid infection, yet bearing a ſtrict reſemblance to it, a few ſtrictures reſpecting its nature and diſtinction follow.

SPONTANEOUS HYDROPHOBIA,

AS RELATING TO MAN,

BRIEFLY CONSIDERED.

BY this term, I would be underſtood to mean a diſeaſe of a convulſive nature, with a dread of liquids, difficult deglutition, and the ſymptoms having a very general reſemblance to Hydrophobia from rabid infection.

This I would divide into two ſpecies; one where a bite from an animal, either mad, or ſuppoſed ſo, preceded; and where terror only ſeemed to excite the ſucceeding diſeaſe; the other, where ſtrong imagination, or deep impreſſions of the mind from various other cauſes induce a train of ſymptoms apparently ſimilar, and ſcarcely to be diſtinguiſhed from the malady excited by rabid infection, unleſs by a ſtrict and nice inveſtigation.

1ſt. With reſpect to terror after a bite; Hydrophobia has always been conſidered in ſo dreadful a light, that it is impoſſible to divert the mind from apprehenſions where a bite has been received. The certainty of death, and that death alſo of a violent kind, ſuch as ſmothering between feather beds, or ſtifling in ſome other manner, carries with it a horror ſufficient to create the higheſt alarm. It cannot be ſurprizing then, to find books filled with hiſtories termed Hydrophobia, but more properly referable to mania, or phrenzy, excited only by fear inſtead of the diſeaſe ariſing from rabid infection; more eſpecially from the practice of immediately deſtroying the animal by which they have been bitten; depriving themſelves thereby of a knowledge of his real condition, whether mad, or merely enraged; or how far ſuſpicions of their own danger may be well founded.

Terror ſuddenly excited is powerful almoſt beyond conception. We read of numerous inſtances of this kind; and moſt men's experience, in ſome part of their lives, affords them examples. It has made the lame, for a ſhort time, forego his crutch; the gouty invalid ſtart from his bed, in ſpite of pain; and nerved the palſied limb into ſpeedy flight: or on the other hand, has rendered the tongue mute; the body motionleſs; perverted the judgement, and deprived reaſon of her empire over the individual ſometimes for the remainder of life.[d]

Hence it comes to paſs, that we ſee it occaſionally excite the very diſeaſe dreaded, and draw into every form of irregular action the agitated muſcles; forcing the heart into ſudden expanſion, or contracting its pericardium to firm adheſion round this fountain of life. Hence likewiſe the loſt power in thoſe parts ſubſervient to deglutition, imitative of Hydrophobia. When the body ſuffers under the higher degrees of this paſſion, death ſucceeds; when under a leſs, health has been reſtored, or cures *ſaid* to have been performed in convulſive affections, named from this ſtrict reſemblance, Hydrophobia.

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[d] Some years ago a common porter, called Pope Badham, reſided in Ipſwich, of whom I have heard the inhabitants frequently ſpeak, who poſſeſſed a power of ſuddenly exciting terror, irreſiſtable for the moment, to the great annoyance of his neighbours. The effect of this ruthleſs joke has often been exactly as here expreſſed: cripples, unable to walk for years, have ſuddenly ſtarted up without their crutches, and fled with agility ſome paces, at the hideous noiſe inſtantly and unexpectedly uttered, in a tone ſuitable to his purpoſe, of "take care!"—"run for your lives!" &c. &c. and ſuch cant words. At the ſame time he ran with violence himſelf, collecting, as he paſſed along, a crowd of affrighted followers, whoſe ghaſtly and diſtorted countenances ſufficiently beſpoke the momentary terror into which they had been betrayed. It was his voice and mode that gave it effect.

Arnold has related one of theſe, a caſe of phrenzy.[e] Nugent has given another:[f] and other authors have related cures of what they termed the ſame diſeaſe. I ſhall content myſelf however only with reciting, as examples, a few.

Mrs. Knott[g] had the misfortune to receive a bite, which threw her into the deepeſt apprehenſions. She had ſeveral attacks of Hydrophobia, and they were always accompanied with ſevere convulſions, and other ſymptoms concomitant to the diſeaſe. She had ſometimes long intervals, but at her beſt health, and freedom from fits, ſhe felt a horror at the ſight of water, and could never touch it without anguiſh and diſtreſs.

The ſight likewiſe of a dog conſtantly impreſſed her with terror. Her huſband, who was a phyſician, ſcarified the part, applied a cauſtic, and kept the wound open for ſome time. For *ſeventeen years* it frequently opened into a running ſore, and again healed up. At theſe times he promoted a diſcharge, and it ſeems, that a habit at length was induced; for the ſore generally broke out in ſpring. Here we can obviouſly trace the attack to fear, united with habit. She ſaw her old ſore re-open; the remembrance of the bite preſſed on her mind; and the doctrine of the poſſibility of the diſeaſe appearing at any diſtant period, gave birth to what followed.

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[e] Vid. Arnold's caſe of Hydrophobia, 1793.

[f] Nugent on Hydrophobia.

[g] Vid. Med. Comment. vol. 6.

One of the moſt noted cures on record is related by Nugent; the ſubject Elizabeth Bryant. From a careful peruſal however of the caſe, it is evident, that imagination, and an apprehenſion of danger, formed the chief ſymptoms attributed to real Hydrophobia.

From the time her apothecary recommended prophylactics and the cold bath, which was a fortnight after the accident, we find her under conſiderable agitation of mind. We cannot doubt of her fears being excited by his ſuggeſtions. Theſe increaſed till Hydrophobia, it is ſaid, actually occurred. She trembled at the very ſight of a dog; nor could ſhe touch one without the greateſt emotion. It is added, that ſhe was well, and could again ſwallow, and continued ſo for ſome time, till an officious perſon told her, that though ſhe thought herſelf cured, ſhe might be ſure to die, and cautioned her not to entertain fallacious hopes of ſecurity. At this ſhe was greatly moved, and inſtantly all her ſymptoms recurred; nor was it without much care, and a repetition of her former medicines, the exhibition of the antiſpaſmodics, that they were removed. A judicious plan of cure was however followed. The diſeaſe was to be ranked, as the phyſician properly conceived, in the ſpaſmodic claſs: he therefore adminiſtered them internally, and applied them externally. He purſued this plan; kept her mind tranquil, and thus ſucceeded. She was ſeized indeed on the 32d day after the bite, or about the common time when ſymptoms of rabid Hydrophobia firſt appear; but it was not till after being alarmed at the dog's going mad, that was bitten by the ſame animal that wounded her.

In a caſe called canine madneſs, treated ſucceſsfully by Wrightſon,[h] the diſeaſe appeared earlier than in rabid Hydrophobia. The boy, Michael Gardener, was bitten on the Sunday; on Tueſday the dog was hanged, under all the ſymptoms of madneſs. Next day Hydrophobia appeared in the boy. On Friday, when Wrightſon firſt ſaw him he was tied down to his bed. The ſymptoms related ſeem more like phrenzy than Hydrophobia, and from their commencement ſo early, I do not heſitate in pronouncing them the conſequence of fear. Wrightſon purſued Nugent's method with ſucceſs.

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[h] Vid. Med. Tranſ.

In a caſe related by Mr. Falkener,[i] where the diſeaſe was alſo ſaid to be preſent, Hannah Moore, the patient, felt no inconvenience, till two horſes bitten by the ſame dog died. All the dogs bitten by the mad animal were then hanged. This could not fail to alarm her. The diſtance from the bite is not mentioned; but a train of ſymptoms are related, reſembling Hydrophobia, and a method of treatment which proved ſucceſsful was proſecuted.

Another caſe of this nature happened at Brentwood,[k] in 1792, and was under the care of Dr. Shadwell. The patient's name was Cumbers: he became affected on the tenth day after a bite from a dog, which ſeemed really to be mad; but about this time a neighbouring lad died hydrophobic, named Wyburn, which excited the patient's alarm, and a train of phrenetic ſymptoms followed, attended with difficult deglutition, all at length happily ending in perfect reſtoration of health. This was ſaid to have taken place from the uſe of oil.

We are to keep in view here in pronouncing this a diſeaſe from terror, the ſhort diſtance from the accident at which theſe ſymptoms took place, the ſmall comparative number of perſons bitten, even by rabid animals, who become ſubject to the malady; and laſtly, the recovery, a thing which has never yet been found where rabid infection has ſupervened.

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[i] Vid. Med. Tranſ.

[k] Vid. Mem. of the Lond. Med. Soc. vol. 3.

The caſe of the clergyman near Mancheſter, fancying himſelf already under the diſeaſe, and actually having a dread of water, merely from viſiting one of his pariſhioners under the influence of rabid infection, in the laſt hours of life, is ſtrongly illuſtrative of what fear and apprehenſion can produce.

Some caſes deſcribed by Dr. Gallet Dupleſſis,[1] evidently refer to this head. One of theſe aroſe from dread of a threatened beating. The ſubject was a common porter, but a man of a delicate habit, and ſanguineous temperament. So great was the impreſſion made by theſe threats, that he fell almoſt immediately into convulſions, dread of water at the approach of the cup, with total inability to ſwallow, and other ſymptoms which accompany Hydrophobia; and after five days died.

The ſame author deſcribes another inſtance which he terms Hydrophobia, ariſing from intoxication.

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[1] Vid. Mem. de la Soc. Roy. de Medicine, Paris, ann. 1783, p. 60.

toxication. Theſe maniacal ſymptoms were accompanied with difficult deglutition, dread of water, &c. They appeared on the third day, and after continuing a very ſhort time the patient died.

He likewiſe deſcribes a caſe of tetanic Hydrophobia, from a young man's biting his own finger, under the impreſſion of rage and jealouſy.[m] The wound was trifling, merely lacerating the ſkin: next day he was ſeized with ſpaſms over the body, but eſpecially about the face and throat, preceded by lancinating pains in the bitten part, extending up the arm: to theſe were added dread of water, ſenſe of ſuffocation, &c. and he died in a fit the fourth day.

An example is given by Van Swieten,[n] of a man, who in a violent fit of anger, gnawed his fore finger, and 24 hours after became hydrophobic, and periſhed under the ſeverity of its ſymptoms.

The caſe of Stanier,[o] as related by Mr. Ruſſel, is evidently ſpontaneous, but ought to be named tetanic Hydrophobia; for though bitten

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[m] Vid. Mem. de la Soc. Roy. de Medicine, Paris, ann. 1783, p. 59.

[n] Vid. Comment. on Boer. Aphor. 1130.

[o] Vid. Lond. Med. Journ. vol. 9, p. 256.

in the younger part of his life, neither was the dog rabid, nor the diſtance leſs than thirty years. Two or three days before the attack he pared a corn on his left foot, and a pain ſtretching up this leg immediately preceded the complaint. Is it not probable, that he had injured either a nerve on the toe, or the tendon; and that the origin of the affection lay there? Hence it will be properly referred, with thoſe juſt related, to tetanus; of which difficult deglutition is frequently the moſt diſtinguiſhed ſymptom.

In the diſſection of this patient, accurately made by Mr. J. Hunter, no marks of leiſon were obſervable in the ſtomach; yet about the cardia, or ſomewhat up the œſophagus he ſaw a few dots of extravaſated blood: but this differs widely from the leiſons in rabid Hydrophobia, deſcribed by Dr. Ferriar. If we refer the origin of the diſeaſe to the corn, the diſtance of attack does not exceed three days, agreeing with the general law of tetanus.

2nd. A dread of water, and difficult deglutition, occur where no obvious cauſe can be aſſigned. Theſe have been more ſtrictly called *ſpontaneous*. They may be the conſequence of other diſeaſes, ſuch as hyſteria, melancholy, mania, &c. In all theſe inſtances there is great difficulty in the diagnoſis, from the ſtrict reſemblance to the rabid Hydrophobia: they often, like it, prove fatal. There is a diſcharge of ſaliva, convulſions on the touch of water, timidity, great ſenſibility to cold air; and even on the inſpection of the bodies after death, leiſons of the ſtomach, ſuch as preſent themſelves in the true, have been detected. Theſe may be more ſtrictly referred to tetanus, or at leaſt to the claſs of nervous affections. Dr. J. Hunter attended one ariſing from hyſteria, which he referred to this head.

Dr. Raymond, of Marſeilles, ſaw a caſe which proved fatal in two days. The ſubject was a lad twelve years of age: no bite whatever had been received from any animal. In the height of the paroxyſm he was unruly, frantic, endeavoured to bite, and had a dread of water.

A woman of forty, in the fifth day of a fever, under which ſhe laboured, became ſimilarly affected with Hydrophobia, which proved fatal.

Inflammations of the ſtomach have ended in Hydrophobia. Dr. Innes ſaw a memorable inſtance of this in a female patient.[p]

Since my reſidence in this country an inſtance of ſpontaneous Hydrophobia occurred. The ſtricteſt ſcrutiny did not diſcover either a bite

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[p] Vid. Edinb. Med. Eſſays, vol. 1.

from a dog, or any familiarity which this patient (a woman) had with this animal for a long time previouſly, as her phyſician[q] aſſerted to me. The patient reſided near Colcheſter. She died of the affection. All the ſymptoms bore the greateſt ſimilarity to the diſeaſe from rabid virus.

Mr. Thedòn, of Berlin,[r] has related a caſe of Hydrophobia, where, without any bite whatever, the patient died. The diſeaſe proceeded from cold: convulſions and tetanus followed; and beſides Hydrophobia, there was a conſtant diſcharge of ſaliva, with attempts to bite all who approached.

Roux, the ingenious author of a diſſertation on this ſubject, defines the *ſpontaneous* an "Hydrophobia from an internal cauſe;"[s] and conſiders it as ariſing from irritation of various kinds induced on the nerves, eſpecially thoſe of the alimentary canal. Acrid fœces, long retained, may, he thinks, be adequate to this effect. Inedia may produce changes in the fluids, capable of the ſame; and fatigue, or long and violent exerciſe in warm weather, may create changes and commotions equally productive of ſuch a complaint. He adduces an example of the latter, by citing the caſe of a boy, who by the fatigue of quick journey in a very warm day, enduring at the ſame time great thirſt, fell ſoon into all the ſymptoms of Hydrophobia, and periſhed in the conflict.

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[q] Dr. Stapleton.

[r] Vid. Letter to Mr. Hoffman.

[s] Vid. Mem. de la Soc. Roy. de Med. ann. 1783.

An inſtance of a ſimilar kind happened to a ſerjeant at mace, as Boerhaave uſed to relate. This man performed a journey with rapidity in ſearch of an executioner, to inflict the ſentence of the law; and while he was warm, as well as greatly fatigued by exerciſe, he ſat four hours in an open boat, bare headed, expoſed to the ſcorching rays of the ſun: nor had he drank any thing that day but inflammable ſpirits. The conſequence was an ardent fever, with Hydrophobia ſo violent, that he refuſed all fluids whatever, and died in three days.[t]

Another inſtance of the diſeaſe, related by M. Roux, is in conſequence of a large quantity of beech nuts eaten by a lad. This hard and inſoluble food, irritating the ſtomach and inteſtines, proved the cauſe, and deprived the boy of life.

A third example reſpects violent agitation of mind. It is the caſe of a young woman in whom Hydrophobia appeared after violent ſtrug-

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[t] Vid. Van Swieten Comment. Boer. Aphor. 1130.

gles to repel the libidinous attempts of a young man againſt her chaſtity. This, like the two former caſes, proved fatal.

The reaſon given by this author for an earlier appearance of the ſymptoms in Spontaneous Hydrophobia after the applied cauſe, than happens from rabid virus is, that the inteſtinal canal being thickly ſpread over with nervous filaments of great ſenſibility, is irritated by the ſmalleſt deviations from the uſual ſtimuli.

Gallet Dupleſſis, already quoted, brings forth a memorable example of the power of internal impreſſions, in giving riſe to this diſeaſe.[u] Here hunger may be conſidered as a prediſpoſing, and the upbraidings of a cruel and relentleſs brother againſt the unfortunate patient, as the exciting cauſe. After having ſuſtained a ſevere ſhock to his feelings from this brutal relative, on account of his poverty; and being compelled at the ſame time to labour in his ſervice, on nouriſhment far too ſcanty for proper ſupport, he took to bed, and in two days became hydrophobic, and phrenetic; was convulſed at the ſight of water, and ſhowed an inclination to bite thoſe around him. He continued to the ſeventh day under this diſtreſſing malady, and then died.

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[u] Vid. Mem. de la Soc. Roy. de Medicine, ann. 1783.

Theſe caſes are all evidently referable to the conflicts of the mind.

Dr. Bardſley's example, ſo well deſcribed, which happened in 1794, is of the ſame nature.[v] The cauſe was certainly equal to the effect; a ſituation more poignant to a feeling mind cannot be imagined, than that of poor Lindſay; the cries of hungry children; his ineffectual efforts to provide them bread; the fatigue of near three days and nights of uninterrupted labour; a mind indignant at the unjuſt treatment of a ruthleſs pariſh officer, which he lately experienced; a temperament naturally melancholic, all uniting to induce a commotion in the body, under the form of Hydrophobia, ſpeedily extinguiſhed life.

It might be matter of curious ſpeculation, to enquire into the probable chemical changes, the decompoſitions and new combinations happening, both to fluids and ſolids during theſe conflicts. The formation of a poiſon in the fluids is within the verge of probability. The waſte ſuſtained by labour and inanition; the addition of cold butter-milk to an empty and weakened ſtomach, as in the laſt inſtance, where the gaſtric juice, and the veſſels ſecreting it, were both perverted; the coats of this organ prediſpoſed to

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[v] Vid. Mem. of the Manch. Soc. vol. 4, part 2.

ready inflammation, are agents adequate to powerful effects.

Inflammations of the ſtomach alone are recorded, as producing Hydrophobia: corroſive ſubſtances, ſuch as the ſulphuric acid,[w] have done the ſame; and internal combinations, even independent of fluids taken by the mouth, might create an inflammation, followed by the ſame ſet of ſymptoms, and by death. This mode of reaſoning, merely as a ſpeculation, may be indulged, and ſerve to account for Spontaneous Hydrophobia; but the reader is left to his own concluſions, or at full liberty to reject ſuch theories, or perfect them into a more conſiſtent ſyſtem.

Lindſay's body was inſpected about 18 hours after death, and the appearances were very far from diſſimilar to thoſe where rabid infection had been received. The diſſection indeed, as Dr. Bardſley regrets, was too ſlightly made to afford that ſatisfaction or information which ſo extraordinary a caſe might have ſupplied. We find the minds of thoſe concerned in the operation ſo deeply impreſſed with the ſcene which they had immediately witneſſed, and a dread (erroneouſly entertained) of infection, that they proſecuted this taſk with great reluctance.

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[w] Vid. James on Canine Madneſs.

Brain. Not examined.----Thorax. No unuſual appearances here, except on the ſurface of the lungs, which was ſomewhat darker, and the veſſels ſomewhat more diſtended with blood than uſual.----Fauces. Nothing unuſual here.----Larynx and pharynx. No diſcolouration in their muſcles.----Stomach and œſophagus. In the latter, not the leaſt mark of diſeaſe: in the former, evident traces of inflammation. This began at the ſuperior orifice, " and was there confined to ſmall and irregular ſpots, of a dark and red colour; and might alſo be traced in a linear form, and of a brighter red, along the curvature of the ſtomach, terminating at the pylorus in large and irregular ſpots of a gangrenous appearance."----Contents of the ſtomach. About three ounces of a dark-coloured fluid, mixed with the medicines taken.---Abdominal viſcera. All ſound.

I have entertained doubts whether Mr. Dundas's patient was a caſe of rabid Hydrophobia. The diſtance from the bite to the attack (18 months) but chiefly the ſituation of mind under which the patient laboured from a fear of impriſonment, led me to a ſuſpicion of its ſpontaneous nature. Under this idea I claſs it here. The body was examined between 24 and 30 hours after death, and the appearances were as follow:

Head. Nothing preternatural.----Brain. Veſſels not more turgid than uſual.----Pharynx. No inflammation, either here or in the neighbouring parts.----Œſophagus and trachea. Covered with a mucus thicker than common. This appearance was attributed to his not having ſwallowed any fluid for 56 hours.----Left lobe of the lungs appeared inflamed.----Edge of the great lobe of the liver the ſame.----The remaining viſcera natural.

Little can be gathered from this diſſection. The ſtomach is omitted, perhaps the moſt material part. Had the diſſection been earlier, more diſcoveries might have been made. The increaſed ſecretion of mucus in the œſophagus and trachea proves a diſeaſed irritation there. The ſmall inflammations on the lungs and liver ſeem rather accidental than parts of the preſent diſeaſe.

The favourers of local irritation, and nervous ſympathy, will doubtleſs avail themſelves of the great ſimilarity of ventricular abraſions in the caſes of Johnſton and Lindſay. They will aſk, where is the difference, even in thoſe parts which the friends of abſorption conſider as the ſureſt diagnoſtic, between the rabid and ſpontaneous affections; and how can they prove a ſpecific poiſon infecting the maſs, by having recourſe to this pathology, when it is here clearly evinced, that an internal cauſe can produce the ſame? To this I can give no better anſwer, than that there are no proofs to the contrary, ſufficient to invalidate the probable ſuppoſition, that in ſpontaneous caſes, a poiſon ſimilar to the canine, be not really *generated*, evolved by a ſpecies of irritation, abſorbed, and mixed with the maſs. Irritation is by ſome means excited. This proceſs muſt precede abſorption. In the variolous and venereal diſeaſes this is neceſſary to the farther activity of the virus: but the irritation in conſequence of the application of theſe poiſons produces inflammation and pus; while the irritation from rabid virus produces none. Irritation from venereal virus is not always followed by pus, yet abſorption is admitted. In what manner are ſome other ſpecific diſeaſes conveyed to the habit? Are not both ſcarletina and morbilli produced without pus, and by the application of infection communicated through the abſorbents? Is not pertuſſis produced without pus, without inflammation, and by a peculiar and ſpecific matter applied to the body, exerting alſo its effects through means of the lymphatics, on the nerves of the bronchiœ, where, I think, it has been depoſited, and on which parts alone it is peculiarly adapted for action? This laſt diſeaſe depends on a nervous affection, equally with Hydrophobia. Who will venture to aſſert, that no abſorption of a materies morbi takes place in the production of typhus fever?

Brevel admits the poſſibility of the production of rabid poiſon from internal cauſes; or, as he ſtyles it, "generated from ſome peculiar *acrimony* in the animal body itſelf."[x] Without being able to prove it by experiments, he preſumes this poiſon to be of a *cauſtic* nature. In giving his ideas of *cauſticity*, he is led to conſider the effects of pure air, and aſſumes, as a principle, its great influence, by chemical affinity, on living animal bodies; and he particularly points at the human body. He oppoſes it to phlogiſton,[y] which he conſiders as a body bearing an affinity to pure air; and that on their union, a new ſubſtance is produced of properties altogether different from each when ſeparate.

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[x] De Veneni Animalium rabidorum Naturâ, ejuſque Medelâ, Diſſertatio. 4to, Lipſiæ.

[y] Phlogiſton, as a body, is now proved to have no exiſtence: yet Brevel's doctrine is not thereby overturned, becauſe by this term other bodies may be underſtood as entering the compoſition of animals, with which pure air has an affinity, forming different combinations.

rate. As each attracts the other from the fluids, a great change is produced in them.

If this new production be of a nature inſoluble in the fluids, its action is on the part where it was firſt generated, inducing inflammation there, and producing pus. If it ſhould happen however, under different circumſtances, to be of a ſoluble nature, it is then diffuſed through the maſs, and may remain there a long time without creating any ſpecific effect. The time will be longer or ſhorter, or proportioned to its ſolubility. On this foundation he would explain, why the diſeaſe appears more readily after any ſevere agitation of mind, ſuch as fear, anger, &c. for the union which it had with the fluids in geral, is deſtroyed in this act; and the poiſon being looſened from this bond, exerts its force on the machine. In aſſuming *cauſticity* as a principal, he attempts, on the ſame grounds, to account for the ſpeedier cicatriſation of a *rabid*, beyond a ſimple and unpoiſoned wound. Its cauſticity, or ſtimulant nature, cauſing a larger diſcharge of gluten from the ſerous veſſels, on which depends the healing proceſs.

A perverſion of the gaſtric juice, one of the moſt active fluids formed by animal ſecretion, the ſtagnation of inteſtinal feculencies, the proceſs of haſtening putrefaction both from the quality of food, from its diminiſhed quantity, or from almoſt total abſtinence for days, are capable of producing extraordinary changes.

Diſeaſes of every kind are induced by changes, deviations from ordinary action; without them it would be health.

View a perſon under a fit of inebriety; obſerve his irregular conduct; his deranged ideas, often with iraſcibility and the other concomitants of this condition. View him when the effects of intoxication have ceaſed; he is rational, ſocial, placid, benevolent. How comes this to paſs? A fluid of a particular kind, mixing with the general circulation, gives theſe changes, is the efficient cauſe. The brain, as a part of the body, from the changed quality and irregular diſtribution of the blood within its veſſels feels this irregular action: the ordinary train of ideas are deranged, and reaſon, for a time, by theſe inordinate ſtimuli, is ſuſpended. The removal of this by ſecretion or excretion, or with the addition of reſt, and the refreſhment of ſleep, and afterwards bland food, reſtore, by a ſecond change, the habit and the order of ideas to their priſtine ſtate. View him again under the humid atmoſphere of a ſunleſs November; gloomy, moping, fretful, irritable, diſcontented with every thing, and even hateful of life. Let him again be viewed under the influence of a ſerene ſky, in April or May; chearful and active as the feathered tenantry of the fields over which he paſſes. Whence ariſes this difference of condition? It is not, as I think, the contemplation alone of a flowery lawn, and cloudleſs ſky, which elevates, nor the diſmal howling of a winter ſtorm that abſtractedly depreſſes him: it is a real change in the component parts of his frame, that accompliſhes both.

The atmoſphere is the food, the ſupport of life; and on its alterations though imperceptible, depend in a great meaſure the changes of his habit, modes of thought, and conſequent action. Theſe examples taken from common occurrencies in life, may in ſome meaſure illuſtrate our argument.[z] But poiſons are in reality generated in the body. Certain fevers are produced from this ſource, and theſe of the infectious claſs,[a] and capable, like the canine virus, of communicating by contact the ſame ſpecific diſeaſe to others. If certain internal changes generate one kind of infection, one ſort of poiſon, certain other changes, poſſible under an immenſe variety, may be fairly allowed to generate another poiſon equally communicable.

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[z] It may be objected to this reaſoning, that the ſight of a beautiful object creates an immediate ſenſation of pleaſure. If this was brought about by a change in corporeal arrangement, its effects could not be ſo inſtantaneous. Muſic, in like manner, ſooths the troubled mind, and rapidly changes the order of ideas from melancholy to pleaſing and agreeable. Its effects in the cure of ſome diſeaſes are well aſcertained in our times without having recourſe to the example of Saul in holy writ, and are alſo as immediate, which would ſeem to militate againſt corporeal change, in theſe inſtances, and would refer the whole to the ſoul alone. But the changes in corporeal order are not leſs rapid than they are minute, and perhaps not to be exceeded but by thought itſelf. I can conceive

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conceive every new idea producing a correſponding action in the animal machine, and the circulation of blood; the vibrations of the heart and arteries, together with the nervous ſyſtem, participating equally. It is difficult to explain how the ſoul and body re-act on each other, but the exiſtence of this re-action is experienced every moment. A new idea may produce a new capacity in the body for abſorbing or retaining more or leſs heat, oxygene, or ſome of the minuter atoms entering its compoſition, or it may abſtract them in part. In this way the ſight of a pleaſing landſcape, or its oppoſite, may be partly ſaid to change corporeal order, and afſect the involuntary actions of the body. Hopes ſuddenly elevated into aſſurances, have ſpeedily changed the cahectic habit, faſt ſinking into the grave, and laid the foundation of a perfect cure. Vid. Regimental Surgeon. ed. 2. vol. I. p. 97. Caſe of Edwards. I have known the removal of a melancholy impreſſion, by a piece of unexpected good fortune, change, in one inſtance, the morbid ſecretion of ulcerated cilia (pſorophthalmia) which had reſiſted for months a judicious treatment, and rapidly promoted cicatriſation. Judicious phyſicians apply with promptitude, and addreſs the effects of the paſſions to the cure of diſeaſes. Changes of the greateſt minuteneſs in living bodies may be productive of great and important alterations, either by inducing a diſeaſed, or promoting a healthy action.

[a] Vid. Reflections on Remote Cauſe in Dogs, vol. 2.

It appears, that the wolf is even more ſubject to madneſs than the dog. On the continent, where this animal is more frequent than in our iſland, the eſtimate is eaſily made. The numerous victims of his fury warrant the concluſion. Hunger among theſe, as among other beaſts of prey compelled to gather their precarious food amidſt ſo many enemies, and at the hazard of daily deſtruction, is much more frequent than with the domeſticated tribes fed by the hand of their kind maſters. In this half-famiſhed ſtate, the changes abovementioned may ſpeedily and readily take place, inducing that diſeaſed rage, which forces them from their lurking places in the midſt of day, to attack whole villages. Probability at leaſt ſupports this concluſion; and if it be admitted, we muſt abandon the opinion of infection *alone* being the ſource of rabies canina, and allow it a double origin as in man, ſpontaneous, and inoculated.

With reſpect to the latter, if both the external and the internal ſpecies give riſe to the ſame ſet of ſymptoms, deviating only by ſome trifling circumſtances in conſtitution, the poiſon producing each muſt have a ſtrict affinity, though generated in different claſſes, the canine, and the human race. "The identity of effects," as Dr. Bardſley ſays, would indeed, "ſeem to warrant the identity of the cauſe." There is however one evident difference; how far it will affect this mode of reaſoning ſhall be left to others to determine. Man, though he receives it externally, and admitting the poſſibility of its being produced internally in his own habit, cannot in either way communicate it. It does not appear however that this will create a change in the mode of cure, for the affinity of the poiſon argues an affinity in the means of removal; and were we fortunate enough to diſcover a ſet of remedies capable of allaying the inordinate commotions excited by the inoculated, we ſhould have great reaſon to conclude, that the ſame would be ſucceſsful in the removal of the ſpontaneous. Theſe remedies have unfortunately baffled the reſearches of mankind from the earlieſt records of this complaint.

From the review which has now been taken of the ſpontaneous and inoculated malady, it will appear not an eaſy taſk to draw a diagnoſtic. If the remedies appropriated to the one, be equally appropriated to the other, this diſtinction will be leſs neceſſary.

I have ſometimes thought that a compariſon of a ſufficient number of caſes of both ſpecies with each other might afford a diſtinguiſhing mark in every inſtance invariable, but my examinations have not confirmed this altogether ſatisfactorily.

The caſe of Lindſay affords little diſtinction either in the ſymptoms, or in the appearances on diſſection. I find however the maniacal ſymptoms, eſpecially in caſes excited by fear, to be far more violent and of longer duration than from the inoculated; and this, whether the patient recovers, or whether he dies: thus Cumbers was agitated by the higheſt delirium. He bit off the ſpout of the tea-pot in which drink was offered to him; he ſtruck his parent who ſtood in anxious attendance near him. His delirium was ſo complete, and he was ſo totally alienated, that after ſome days when the diſeaſe yielded, he had not the ſmalleſt recollection of what had paſſed during his illneſs, "it preſented a perfect blank to his mind."

Others have been ſo violent, that four, and ſometimes ſix men were not more than ſufficient to hold them; others again have been bound down in bed by ſtrong cords, and even then with difficulty held faſt. This ſometimes occurs to a conſiderable degree in rabid caſes, but the intervals are longer, and the rational faculties, except in the exacerbation, remain unimpaired. The exacerbation is, for the moſt part, a reiterated ſeries of convulſions, torturing and twiſting

ing the body, eſpecially the breaſt, throat and countenance, without fury and without mania.

I have thought alſo, that ſome diſtinction might be drawn from the ſalival diſcharge: this however, though in ſeveral, will not in every inſtance hold good; for in Lindſay we find "an unuſual flow of viſcid ſaliva;" yet in other caſes, eſpecially thoſe where the diſeaſe was conquered, little notice is taken of this diſcharge; and from from thence I conclude it to have been ſo inconſiderable as not to have attracted attention.

Michael Gardener, as deſcribed by Wrightſon, had no preternatural diſcharge, nor is any mentioned in Falkener's patient, Hannah Moore. The old man, Stanier, ſpat frequently, but his ſaliva is ſaid not to have been much in quantity, when at the height of the diſeaſe, though viſcid; and at a later period it was obſerved not only to be diminiſhed in quantity, but was more fluid. The ſame will be found in peruſing other caſes of the ſpontaneous kind, which would be tedious as well as ſuperfluous to enumerate here.

Spontaneous caſes ariſing from internal cauſes, whether from depreſſing paſſions of the mind aſſiſted by conſtitution, or by changes in the habit, occaſioned by the quality or ſcantineſs of food, being gradual in their approach, like rabid Hydrophobia, reſemble it likewiſe more intimately in their ſymptoms. This is exemplified not only by Lindſay, but by the poor man whoſe diſeaſe aroſe from hunger, and the corroding ſtings that his wounded mind experienced from the barbarous treatment of a brutal brother. It is exemplified likewiſe in the old man, mentioned by Morgagni, who fell into melancholy and deſpair, and afterwards into Hydrophobia, from apprehenſion of a threatened beating.

The rabid caſe however, though it cannot always be diſtinguiſhed from the ſpontaneous, yet will be found conſtantly accompanied with a copious viſcid ſalival diſcharge, exciting great part of that diſtreſs accumulated by the advancing diſeaſe. It is this which ſo often nearly ſuffocates the patient; it is this which excites in him the ſame horror and convulſions as are excited either by the ſight or touch of a fluid; it is this which produces the conſtant hawking, ſpitting, ſudden and convulſive expirations, imitative, at leaſt as figured by a warm imagination, of the ſtifled barkings of a dog in the act of gnawing a bone, under fear of its being ſnatched away.

I believe the ſame in quantity, quality, and mode of excreting the ſaliva, will not be found in the ſame ratio of aggravating circumſtances in the ſpontaneous, even from internal cauſes. I know not what information might be derived

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from an experimental inveſtigation of rabid ſaliva, but the examination merits a trial. Hitherto fear of infection deterred men from ſufficient anatomical reſearch; and the ſaliva, above all fluids, was ſhunned with the greateſt care, dreaded as the certain foundation of infection. Accidental cauſes however gave birth to doubts on its infectious nature, and obſervation, often repeated, ſtrengthened them. Some of theſe will be brought under the reader's review hereafter,[b] ſufficient, it is hoped, to remove every idea of future injury from handling or making experiments on this fluid.

An ingenious author[c] has inſtituted a number of experiments on healthy ſaliva. To diſcover the component parts of the healthy, is a proper preliminary to the diſcovery of the component parts of this ſecretion under diſeaſe, or the diſeaſed admixtures with which it may be contaminated. His trials however were made on the ſaliva of the horſe, not on the human ſubject; but the analogy is very near; and as this fluid performs the ſame offices in the one as in the other ſpecies, being in both, nay in every animal, equally ſubſervient to digeſtion, the difference in compoſition between them muſt be ſo trifling, that little apprehenſion need be entertained of erroneous concluſions.

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[b] Vid. vol. 2, Hydrophobia in Man, not madneſs, &c.

[c] M. Hapel, profeſſor in the Veterinary College at Paris. Vid. Obſervations et Experiences ſur l'Analyſe de la Salive du Cheval.

His experiments were made with pure ſaliva, by heat in open and cloſe veſſels----with the water bath----by diſtillation, moiſt and dry----with diſtilled water----with ſyrup of violets, as a teſt of alkaleſcence----with ſpirit of wine----with boiling water----with terra ponderoſa, calcined magneſia, and lime, ſeparately triturated with ſaliva----with fixed cauſtic alkali----with volatile cauſtic alkali----with nitric acid----with ſulphuric acid----with muric acid----with diſtilled vinegar----with acid of ſpar----with a ſolution of cream of tartar----with acid of ſugar----with phoſphoric acid----with oil, and with æther.

He next inſtituted experiments on impure ſaliva, or ſaliva mixed with the mucus of the mouth. Theſe were made by diſtillation in the water bath----on the naked fire----with water ſimply----it was examined in common air----by quicklime, and with cauſtic alkali.

He found that ſaliva, as indeed might eaſily have been ſuppoſed *a priori*, to be very different when proceeding immediately from the gland, from what it is when mixed with the mucus of the mouth and fauces.

To obtain pure ſaliva, he laid open, longitudinally in form of an orifice for V. S. the duct leading from the gland,[d] whence it poured in abundance; and by making the animal eat, the motion of the jaw aſſiſted the diſcharge till a ſufficiency was collected.

The reſult of his trials were, that no ammoniacal ſalt whatever exiſted in the pure ſaliva, which after mixture with the mucus of the membranes and glands of the mouth, was conſtantly preſent. The pure however had a ſaline taſte, a ſoapy feel, and was of a greeniſh yellow colour. Its ſmell was weak, but peculiar. When proceeding immediately from the gland it is fluid; but if preſerved ſome time the evaporation of its water renders it ſomewhat thick. It is lighter than diſtilled water, for it ſwims on it; nor did it appear from trials under the air pump to contain air. When kept for five days, marks of putridity were perceptible; and at the end of ſix weeks, it became dried into a black earthy ſubſtance. Pure ſaliva, placed in a ſmall phial in an air pump, filled with *pure* air, did not putrify for *ſeveral* weeks; but at length marks of putrefaction were manifeſt. No acid fermentation preceded the putrefactive proceſs. When it was placed in a water bath it loſt its tranſparency, became flaky, and ſunk to the bottom of the veſſel. The ſupernatant liquor was extremely fluid, and ſhowed neither marks of acidity, nor alkaleſence. When kept for fourteen days after diſtillation, it had a ſmell reſembling amber, a ſmell which has been diſcovered in the water after diſtillation of ſome other animal ſubſtances.[e]

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[d] Steno's duct.

Pure ſaliva mixed with diſtilled water, becomes diſſolved in it, looſing its taſte, colour, and conſiſtence; but it imparted to ſyrup of violets a green colour. Spirit of wine precipitated from it a coagulum, which again diſſolves in water. Saliva thrown into boiling water is coagulated; but is *not* ſoluble again in water. Terra ponderoſa, calcined magneſia, and lime ſeparately triturated with ſaliva, diſengaged no odour marked with volatile alkali. Fixed cauſtic alkali produced no ſmell. Volatile cauſtic alkali[f] was found to augment the fluidity of ſaliva. Nitric acid rendered it very mucous. Muric acid thickened it, and yellowiſh filaments were precipitated. Diſtilled vinegar produced no effect on it. Diluted ſulphuric acid poured on it, produced a coagulum, which was precipitated under the form of a thick pellicle; this was of a yellowiſh brown colour, but by ſtanding the colour became much deeper. When the liquor was filtrated and evaporated, cryſtals of Glauber's ſalt remained.[g] The acid of ſpar, united to ſaliva, rendered it mucous, and produced a browniſh precipitate. Solution of cream of tartar altered the conſiſtence of ſaliva a little, though ſlowly. The acid of ſugar rendered ſaliva more mucous and produced a ſlight precipitation. Some thickening followed admixture with the phoſphoric acid. All the different acids employed formed, with ſaliva, different neutral ſalts; but the foſſile alkali[h] was the baſis of all.

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[e] " From eight ounces of ſaliva which were employed in this diſtillation, M. Hapel obtained ſeven ounces ſix drams of water; and the matter contained in the retort being collected with care, weighed one dram thirty-ſeven grains. The loſs, thirty-five grains, was attributed to the air which had been diſengaged during the diſtillation. The reſiduum in this caſe reſembled mucilage in a dried ſtate, and when it was expoſed to the air it attracted humidity.

" Having expoſed this reſiduum to the action of a naked fire, in a glaſs retort, provided with a proper apparatus, he obtained a yellowiſh-coloured water, highly alkaline, weighing one dram ſix grains; a yellowiſh oil to the extent of four grains; ſix grains of cryſtallized volatile alkali; ſix grains of thick empyreumatic oil; ſix grains of inflammable gas and aërial acid. A charcoal remained in the retort, weighing eight grains, and retaining the ſhape of the dried ſaliva before it was ſubmitted to the action of fire. All theſe weights taken together, amounted to one dram thirty-ſix grains, the complete weight of the matter employed in this diſtillation." Vid. Med. Comment. D. 2, vol. 5.

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[f] Ammonia pura.

[g] Soda vitriolata.

The coagulum obtained by theſe different combinations with acids were not ſoluble in water, but were completely ſoluble in volatile alkali. Saliva is found to diſſolve oil.[i] Spirit of wine and æther diſſolved a ſmall quantity of ſaliva, but it ſoon precipitated in form of thick mucilage, which is ſoluble in water. This proves it to be different from that produced by the action of acids.

From theſe experiments, as M. Hapel obſerves, pure ſaliva appears to be "a mucilaginous watery fluid, formed of a proportion of air, oil, and water, of the fixed mineral alkali of ſea ſalt, and of an inſoluble ſubſtance, which ſeems to be of the ſame nature with the baſe of the bones." Sal ammoniac not being a component part of ſaliva, though the contrary be aſſerted by different phyſiologiſts, when it is found in it, proves it not to be pure.

Saliva mixed with the mucus of the mouth, has a ſaline taſte, and is more viſcid than the pure. This may be attributed to the mucus of the mouth, and the loſs of ſome of its water. The tendency it has to form into a froth is explained by its ſoapy quality. By agitation through the mouth, and the contact with the atmoſpheric air, and air from the lungs, it forms in the ſame manner as ſoap with water, bubbles containing air. Diſtillations of ſaliva from the mouth, both in the water bath and naked fire, give the ſame products as pure ſaliva. Quicklime and cauſtic alkali diſengaged from it an odour ſtrongly marked with volatile alkali, diſtinguiſhing it peculiarly from pure ſaliva. This laſt proves, the author thinks, the ſal ammoniac of the ſaliva contained in the mouth to be a conſtituent part only of the mucus of the mouth. He could not determine what particular acid was united with the volatile alkali in this ammoniacal ſalt.[k]

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[h] Soda.

[i] Uſeful in taking greaſy ſpots from clothes.

Theſe experiments lead to ſome concluſions, even in the morbid caſe under review. The thickening of ſaliva in Hydrophobia being uniform, whether by a vitiated mucous diſcharge from the membranes and glands of the mouth, or from the ſtomach itſelf and œſophagus, is always troubleſome. To diſſolve and render it more eaſily ejected, would be a moſt beneficial ſervice; and if it be true, as here intimated, that the cauſtic volatile alkali is capable of giving fluidity to ſaliva and mucus of the mouth, inſpiſſated by mixture, an important remedy would appear to be diſcovered. This has indeed been adminiſtered in a few inſtances of late years, but neither in a doſe, nor perhaps in a manner well-adapted, nor by a plan ſo judiciouſly preconcerted as to give it full effect, and obtain its higheſt efficacy. The patient indeed becomes highly affected by the touch of any thing fluid, and this may render it a diſcouraging circumſtance in the adminiſtration; but a pilular form might render it more commodiouſly exhibited, which may be done by mixing it with crumbs of bread. It is at leaſt worthy a trial, that its value may be fairly appreciated, and the reſult exactly known.

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[k] In theſe experiments M. Hapel was aſſiſted by the celebrated Fourcroy.

Theſe experiments ſeem farther uſeful in pointing out ſubſtances which thicken the ſaliva, rendering it more adheſive and troubleſome in the fauces. It would ſeem to follow, that we ſhould ſhun them in practice. The nitrous acid ſeems to be one of theſe; yet this perhaps is more theoretical than rational; and experience likewiſe ought to determine reſpecting the fact. Theſe hints may lead the ingenious into a field of uſeful inveſtigation. At preſent I do not feel myſelf competent to go farther. In what follows therefore I ſhall confine myſelf to the examination of a few remedies in more common uſe in the preſent times, rejecting the various and accumulated farragos offered by credulity and ſuperſtition.

END OF VOL. I.

BRITISH MUSEUM 23 JY 88

ANNOTATIONS AND CORRECTIONS

By the Author and ſome of his Friends.

Page 3. THE aſſertion made here is ſurely too ſtrong, conſidering that this is a manufacturing country, and probably that more than three-fourths of the inhabitants are engaged either in the arts, or in military life.

Dr. MACQUEEN.

This obſervation which my friend, Dr. M. notices, was chiefly intended to apply to the county wherein I reſide, and a few of the adjacent counties, where great care is taken to preſerve game. The frequent proſecutions for poaching, and the frequent diſputes even among neighbouring gentlemen, occaſioned by the pertinacity with which they perſevere in keeping from moleſtation this part of their property, appeared ſufficient to authoriſe the reflection. The preſent war has only leſſened poaching for a time; but it muſt be ſome fortunate modification of the game laws which can deſtroy the practice, and end diſputes. Dogs are certainly fewer in number ſince the tax was impoſed. Small as it is, its operation in this part of the country, and within my ſphere of knowledge, is already conſiderable.

The AUTHOR.

Page 7, *line* 11, 12, 13, corrected thus:---- or a combination of particles may be formed from internal cauſes, ſufficient to conſtitute infection, and give birth to the diſeaſe.

DR. MACQUEEN.

Page 15, *line* 16. Would it not be more correct to ſay, by exacerbation and *remiſſion*, than exacerbation and *interval*; the latter term implying a perfect *ceſſation* of the ſymptoms, the former only an alleviation of them? Of this the author will beſt judge.

DR. MACQUEEN.

It is difficult to determine this point in the dog, with abſolute certainty, as we can in the human ſpecies. I ſpeak only from the animal's action, which in every part reſembles that of ordinary health. In the human ſpecies, where the examination can be more intimately made, the diſeaſe has only remiſſions, though theſe be for a time tolerably complete. A nice obſerver might, I think, diſcover ſome marks of diſeaſe in the dog's eye, and ſomething alſo in his general manner deviating from health. This I have noticed in the hiſtory of the dog under conſideration, by his convulſive dream, and by his particular motion in running along the pavement. The criticiſm therefore appears juſt, and *remiſſion* would have been a more appropriate expreſſion than *interval.*

The Author.

Page 21, *lines* 2, 3, 4, 5, 6, corrected thus:—She did not tear the child, as ſhe did the kitten in the morning, but left her on her crying the moment the ſnap was given. The fury of the bitch did not continue, ſhe being gentle immediately after, ſuffering the family to fondle her as uſual.

Dr. Girdlestone.

Page 32, *laſt line*—the other, whether the abſorbing veſſels, by a general law belonging to their nature, after a due time drink up the poiſonous ſaliva inſerted into the wound, and this being carried into the general maſs of circulating blood acts on the nerves in a ſecondary manner and ſo produces the diſorder.

Dr. MACQUEEN.

Page 36, *line* 10, ſhould run thus:—and conſequently he rejects the idea of abſorption whereby the maſs of fluids are tainted.

Dr. MACQUEEN.

Page 60, *laſt line*. There can be no doubt but that the cauſe of the more violent effects ariſing from the bite of the viper in ſummer than in winter is its being more active and vigorous in ſummer, when a greater quantity of poiſon is ſecreted, and conſequently inſtilled into the wound, which will of courſe be deeper and larger. The ſame difference is obſerved by Fontana to take place when the animal is enraged, or not, before the bite be inflicted.

Dr. MACLEAN.

The difference between different men in their experiments on the ſame ſubject, and the oppoſite concluſions drawn by each, create great confuſion in ſcience. The inquirer after truth knows not ſometimes whom to follow.

Mead and ſome friends ventured to taſte the poiſon of the viper, firſt diluted with water, and then in its pure ſtate. Diluted it gave marks of activity, according to them; and in its pure ſtate ſtill greater. An inflammation was raiſed in the part to which it was applied.

Redi again had made the ſame aſſertion, not as it would appear from his own trials, but on the authority of a viper-catcher, whom he knew. This man boaſted that he could ſwallow it by ſpoonfuls; and this naturaliſt adds, that the man has been ſeen to take it.

Fontana* aſſerts it to be of a nature reſembling oil, or ſomewhat like the reptile's fat; and harmleſs when applied to the tongue: this is the reſult of more than an hundred trials on himſelf. A ſenſation of aſtringency was imparted to the tongue and lips, which did not follow immediately, but came on after ſome time, and continued for ſeveral hours. He found it alſo harmleſs when applied to the adnata of different animals, or to the membrane of their internal nares. He concluded this poiſon to be ſweet and agreeable in taſte, becauſe dogs devoured it greedily, and licked their lips afterwards, as if pleaſed. From all which, he infers it to poſſeſs neither pungency nor cauſticity, nor does it excite inflammation, nor give pain. His ſervant Jaques, who was often the object of the ſame experiment, ſubſcribes fully to his maſter's opinion. But the bee, the hornet, and the waſp afforded very different concluſions; for when their poiſon was taſted, the ſenſation was pungent and extremely painful.

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* Vide Experiments on the viper, vol. 1, p. 54, tranſlation.

The experiments detailed in the paſſage to which Dr. Maclean alludes taking them for granted to be accurate, ſeem to warrant the inference there drawn. The vigour of the viper, as well as of the rattle-ſnake, is conſiderably augmented by the heat of the ſeaſon. The quality of the poiſon even appears to be different, and the quantity of ſecretion augmented in a given time. Something of the ſame kind may likewiſe take place from the occaſional rage of the reptile. The rapidity of the circulating fluids becomes increaſed from the increaſed ſtimulus produced by this paſſion. The ſecretion of the poiſon from theſe fluids will bear ſome proportion perhaps to the influx into the ſecreting organ. This languor and torpor induced by the winter's cold ſeem a natural conſequence of the ſlower motion of the circulating fluids; it is a well-known law in animal life; it is a law equally cogent in the vegetable kingdom. This checks the ſecretion of poiſon, and *modifies* and *moderates* its virulence.

The Author.

Page 68, *line* 16. Five inſtances of this kind occurred to my obſervation, where no traces of inflammation or chancre could be diſcovered about the glans penis or urethra.

Dr. Maclean.

Page 76, *line* 5, *from bottom.* I ſhould be diſpoſed to conclude that the ſaliva had no ſhare in the production of ſuch effects, but that they aroſe from irritation, on the ſame principle that a wound occaſioned by a nail, thorn, needle, or the like, is often followed by ſimilar effects.

Dr. Maclean.

Page 91, *lines* 8, 9, 10, *corrected thus.* Might not hyſteria or epilepſy be conſidered more ſtrongly allied to tetanus than Hydrophobia?

Dr. Macqueen

Page 94, *line* 6 *from bottom.* I have known it a year and half.

Dr. Rodbard.

Page 104, *lines* 21, 22, 23, 24, *corrected thus.* By the looſe part of the clothing which he laid hold of, and by timely aſſiſtance ſhe received no other injury from him.

Dr. GIRDLESTONE.

Page 109, *line* 13. A medical friend informs me that a caſe occurred to him of a ſailor, who was ſeized with tetanus *in the courſe of the night*, from ſleeping on deck in Whampoa, in China, after a hot ſultry day. The night was cold.

Dr. MACLEAN.

Page 111, *line* 7 *from bottom*. In the caſes mentioned in my remarks to you,* it appeared at a more diſtant period; and you may rely on the accuracy of the dates, as I witneſſed the origin and fatal termination of them all.

Dr. MACLEAN.

Page 134, *line* 14. An experienced inoculator† affirms to me his having obſerved ſigns of abſorption ſometimes ſo early as the ſixth and ſeventh day. This makes from two to three days between beginning abſorption and the commencement of variolous fever. To interrupt the diſeaſe exciſion ſhould not be later than the fifth or ſixth day.

The AUTHOR.

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* The Author. Vide Appendix, vol. 2.

† Dr. Rodbard.

Page 149, *line* 5. I would recommend the liquid cauſtic alkali, or aq. kali pura, or a ſtrong ſolution of cauſtic in water, in preference even to the knife.

Dr. Maclean.

Page 219, *line* 11. In the notes taken down after my firſt viſit to Francis Tweed is the following remark: "He had been ordered conſiderable quantities of vinegar before I ſaw him; but inſtead of producing any good effect, it ſeemed to increaſe the ſickneſs and vomiting with which he was affected in a moſt violent degree. Beſides conſiderable quantities of viſcid ropy ſaliva, a yellow bilious matter was likewiſe vomited." The violent ſpaſmodic and convulſive affections commenced much earlier, and the diſeaſe terminated ſooner than in the caſe of Jeremiah Groves.

Dr. Maclean.

I have refrained from making any remarks on the doctrine, though I have been tempted to it on one or two points, eſpecially that of abſorption, which I ſuſpect is puſhed too far at the expence of the nervous ſyſtem, in ſome parts of your analogical reaſoning.

Dr. Macqueen.

As I am in ſearch of truth, and embrace that opinion only which appears to me to approach neareſt to it, I muſt allow the ſame right of private judgement, not only to my friend who gives the above hint, but to others. Candour requires me to lend a patient ear to arguments aganſt this doctrine. I deſert an opinion the moment that it is proved to be erroneous. De Haen, and others uſed many ingenious arguments againſt the inoculation of the ſmall pox. In ſpite of their ingenuity the practiſe prevails and benefits mankind. The doctrine of the circulation of the blood too was oppoſed; and abſorption itſelf, as carried on by a ſeparate ſyſtem of veſſels appropriated to, that end met with no little oppoſition.

The lacteals were even deprived of their province of conveying nutrition, and the body was ſaid to receive it through the medium of the nerves. It has been contended alſo by a modern phyſiologiſt, that the extremities or endings of nerves were the beginnings of the muſcular fibre.* The nervous ſyſtem is certainly of the higheſt importance in the animal œconomy; this is ſo apparent as to ſtrike the moſt common obſerver, or the moſt unlettered peaſant. Hence perhaps it comes to paſs, that more offices have from time to time been beſtowed on this ſyſtem, than maturer obſervation ſanctions, or experiment approves.

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* Vide Cullen's Phyſiology.

If the opinion be ill founded which reſpects abſorption in Hydrophobia, no argument, howſoever ingenious or laboured, will long prevent it from ſinking into neglect. If the diſeaſe be really produced by local irritation, and by ſympathy of nerves, obſervations will multiply, and facts will be diſcovered, which will place this doctrine on a foundation beyond the ſtrongeſt oppoſition to overturn. Diſcuſſion at preſent may benefit the public, while a better explanation of the *modus operandi*, and a more certain and ſpeedy method of cure may be the happy conſequence. If this end be obtained I ſhall feel little concerned at the overthrow, or refutation of my opinion.

The AUTHOR.